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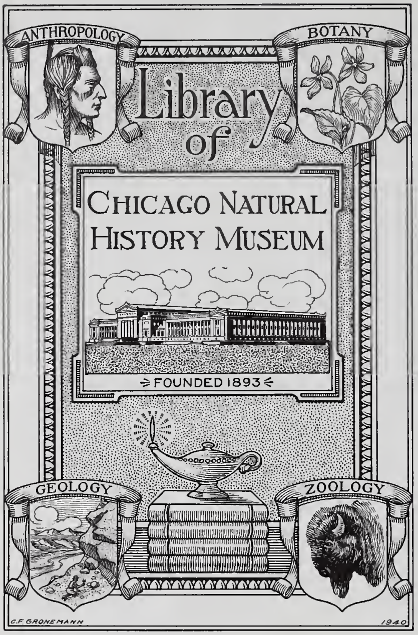
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AUCKLAND MUSEUM CONCHOLOGY CLUB

BULLETIN No. 7

AUCKLAND, NEW ZEALAND

NOVEMBER, 1951

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AUCKLAND MUSEUM CONCHOLOGY CLUB
BULLETIN No. 7

EDITORIAL

WITH this issue a milestone has been reached. Not since our first Bulletin have we been able to have it published in printed form., and it is hoped that this move will be a permanent one.

Record attendances at the monthly meetings this year and the fact that our membership is increasing by leaps and bounds indicates the continued growth in popularity of our hobby. A notable feature of members' collecting activities during the year has been the number of new species and rarities that have been found. Accounts of several finds are recorded in this issue. Next year we hope to have some illustrations.

The committee is anxious to further improve the standard of the Bulletin and will be pleased to have readers' suggestions.

We wish to thank Mr. A. W. B. Powell for his invaluable help and all those who have made the printed publication of this Bulletin possible.

N. W. & E. N. GARDNER, *co-Editors,*
1st November, 1951.

★

NOTOPLAX CUNEATA

by WM. P. THOMSON.

THE writer had the good fortune at the beginning of the year (January, 1951), to collect a goodly number of this most beautiful member of the family Cryptoconchidae, and would like to put on record some details and observations surrounding the occasion.

Suter, who described the species in 1908, gives a very detailed description in his "Manual of New Zealand Mollusca," published in 1913; but, no matter how technical and detailed the description may be, it cannot bring fully to the mind's eye the beauty of this attractive member of a very interesting family.

It should be pointed out, however, that apparently Suter had little material available on which to base his findings. His closing remarks regarding it in the Manual are: "I have only one specimen, and it is highly desirable that more examples should be obtained and carefully examined." The dimensions he gives are: length, 22 m.m.; breadth, 11m.m.; dry specimen.

The writer understands that a few odd specimens have been found since 1913, both the Manukau and the Tauranga Harbours being mentioned in this connection: and it is possible that they may have been found elsewhere. However, some information on the specimens recently collected may be of interest, particularly in regard to their habitat, and it is to a young member of our club (Mr. Stuart McFarlane) that credit must go for locating what would appear to be a well-established colony of them.

Of the 50 odd specimens collected by the writer the dimensions varied from 40 to 47 m.m. length; 23 to 30 m.m. breadth, dry specimens.

The colour of the mantle varied from a predominating orange-red to a grayish-black; most of them being blotched. There is also a great variation in the colouring and the markings of the dorsal area of the valves, the markings being mostly grey, brown and black on a background of either pink, silver-gray or ivory (pastel shades). No two specimens are identical in colouring. The interior colouring also varies from white, pink (some almost violet) to green.

The mantle is leathery, and like wet, untanned leather, can be pressed in at one place only to bulge out elsewhere.

Now regarding the habitat. One would expect to find them, like the other members of the family (and because of their structure), attached to a stone, or at least to a dead shell or some other stable object, but to the writer's great surprise they were found to be free-moving, just under the surface of the sand, at and below dead-low water, the locality being the inner beach at Mount Maunganui.

The only indication they gave of their presence was a slight indentation or unevenness on the otherwise smooth stretch of sand. It is likely that this tell-tale sign would vary according to the nature of any particular locality, because, on this occasion, following the same signs, the writer found specimens of Baryspira australis as often as N. cuneata.

On a flat shelving beach (*e.g.,* Cheltenham Beach, Auckland), the former leave a long, unmistakeable trail, the animal being found in a small mound of sand at one end. It seems hardly likely that the Notoplax would travel so quickly, or leave such a well-defined trail, it being flatter.

The writer, when collecting, placed the specimens found into a large glass jar partly filled with sand and sea-water, and noted that they all found their way to the sides or bottom of the jar, and having attached themselves to it, seemed content to remain there without moving.

★

HUNTING PARYPHANTA ROTELLA PATRICKENSIS

by A. C. O'CONNOR.

On 7th February, 1951, I left Wellington en route to Seddonville to stay with my old friend W. H. (Harry) Johnston for a fortnight. Needless to say the main objective was snails. I reached Seddonville on the next day and found Harry busy finishing a new double gate so that I could get my car into his place.

After a lengthy korero, we decided our first objective should be the rare P.r.patrickensis. Accordingly on the next day, after listening to a favourable weather report over the wireless, we left for Denniston, which is situated on the edge of a plateau about 2,000ft. above sea level, and is reached after climbing a steep and tortuous road, which I think has more hairpin bends in its 5½ miles climb than any I know.

All going well we reached the top, and then had to decide where we thought the snails would be found. Sometime previously in 1948, Dr. Oliver had some specimens given him from this area, but from just where wasn't too easy to decide. We started off by going through the little mining township, Burnett's Face, and down the road towards the Cascade Mine. We tried several likely spots, but the results were nil. We then returned to Burnett's Face and dug out one of the oldest inhabitants, but alas, he was no Conchologist, and we got no information of any use.

We then went down to Cook's Lease by the new Cedar Road, which finishes at Begg's Outcrop. Incidentally, we took home a sack of coal from here and expert Harry tells me it is about the best coal he has ever burnt. We had lunch here and spent several hours on a fruitless hunt, mostly in the bush at the edge of the road. Unfortunately the weather forecast did not come true, and we got a real West Coast downpour. Sixty miles, results Nil, not even a "dead."

After a week's spell, or rather a week on other species, we decided we would have another go; so, on the 16th February, we set sail again for Begg's Outcrop, as Harry was of the opinion that we had not worked the right type of country the previous trip, and that we should make for the edge of the pakihi further north, towards the Waimangaroa River. Harry took the line slightly inside the bush, while I kept along the edge. The track, after about half a mile, descended towards the river, and after quite a bit of hunting, I at last found some deads. Deads in this species, I may explain, are seldom of any use, as the shells are practically all conchin without any lime, and the result in nearly every case is a very damaged specimen. Harry joined me here, and he also was pleased that we had at last found the habitat. After a yarn and before he was out of hearing I shouted "*a live*," which brought him back at the double to shake hands and have a look-see.

I may say here that Harry's eyesight is not so good as it used to be and intensive searching for "lives" is too trying for him, but send him over an area of country and I will guarantee that if there are any deads about he will spot them. He then takes great pleasure in leading me to the spot saying: "Deads here, go to it." My job is then to delve under the Gahnia procera, etc., and hunt. This arrangement suits us both very well, as I cannot keep up with him when it comes to a hike. To return to the hunt, I kept at it for several hours with, of course, a stop for a "boil up," and succeeded in getting five lives, after a lot of hard work. Needless to say, this time we returned home feeling quite pleased with ourselves.

After a day's spell we left on the 18th February for our third and last "patrickensis" hunt. On this occasion we did not have to waste much time with preliminary searching and went straight to the site of our last hunt. Harry, this time, crossed the river, and as I had only two lives after about an hour's searching, I soon started to call for my mate across the river. He came back and reported deads, and also said there was a dilapidated suspension bridge across the river, but thought that perhaps, to be on the safe side, I had better take off my boots and socks and wade. Needless to say I took the dare and the bridge, which really wasn't too bad. Harry here left me on a hike to survey the surrounding country, which took him about three hours, and returned reporting quite a lot of deads over most of the country. I myself concentrated on the area just over the river, and by the time he had returned, had seven lives in the bag. This time I got them under gahnia, loose bark and fallen branches.

After a smoko, Harry took me further up the river to a likely spot on the other side, but the cover was rather dense and a few wekas as rival hunters, so was pleased to get another two lives. This made a grand total of 14 lives for three trips, and a mileage of about 180.

We then left for home, calling on the way at Whareatea, where Harry had previously found some deads, but we found no lives. The habitat here seemed to be an innocent looking rush-like plant, Hypolaena lateflora, which creeps over the ground, and at first sight looks easy hunting, but after a trial you soon change your mind as it is as tough as nails.

Having given our experiences I may as well give a short history of P.r.patrickensis. The first shells were found by W. H. Johnson on 6th April, 1948, at about 2,300ft. above sea level, near the headwaters of St. Patrick's Creek, which enters N.E. into the Ngakawau River. Later, on the 18th April, 1948, W.H.J., accompanied by A. W. B. Powell and the Prouse cousins, spent two days in this area and took nine lives, the smallness of the catch being due no doubt to the sparse forest, most of which has been, according to W.H.J., devastated by forest fires over the years of pakeha settlement. Owing to an illness of W.H.J. this area has not been visited again. Dr. Oliver, however, had some shells given to him from the Denniston area in 1948, and W.H.J. found some deads in the Whareatea area in September-October, 1949.

The following is a description of the country in W.H.J.'s own words: "Cook's Lease area is three miles from Burnett's Face or five miles from Denniston by quite a good road and is in a geological trough looking about N.E./S.W., with Mt. William's Range on the south side and Mt. Frederick on the seaward side. The flora is what we conchologists call tough, but no so tough as south of Seddonville. The taller trees are Nothofagus menziesii, Rimu, Southern Rata, Tanekaha, Pink Pine, Kaikawaka, under which are various coprosmas along with juveniles of the taller trees. The Mountain Pine makes snail hunting difficult, as having poor rooting it falls and yet keeps on growing, and helps to keep a mass of moss over the earth floor. Some Manuka intermingled with umbrella fern and pakihi grasses and sedges form a splendid home for Paryphanta, even against Homo sapiens and Wekas. Montane flora is now to be found on the fired area."

★

COLLECTING CASSIDIDAE IN THE LEIGH DISTRICT

by T. P. WARREN.

THE family Cassididae is represented in New Zealand by the genus Xenophalium, Iredale, 1927, and the subgenus, Xenogalea, Iredale, 1927. Xenophalium typical is represented by the species royanum, Iredale, 1912, which is a tropical species and found here only in deep water in the far north. It is one of our very rare shells and is keenly sought after.

The subgenus (Xenogalea) is represented by eight known Recent species which range from the far north to Stewart and Chatham Islands, and it is with the local occurrence of some of these that I propose to deal.

X.pyrum is, of course, the most common species found here. The southern end of the ocean beach at Pakiri is a good place to collect them, and they also occur at the sandspit at Whangateau after storms. Most specimens seen are almost typical, but now and again some unusual varieties are met with. One in particular from Pakiri is interesting. It is a very thin shelled, brightly coloured variety, with a somewhat attenuated spire, and the characteristic row of nodules is either completely absent or else very faintly defined.

Another kind is a squat shell reminiscent of the Fosterian harrisonae, but has a thinner shell and bears the true pyrum nodules. Of four specimens, two have a depressed spire, while the other two are more elongate.

One more variety is rather similar to X. powelli, and may perhaps prove to be this species.

From Whangateau I have collected three or four specimens which appear to me to be X. ericanum. They are fairly large, solid shells, with a thick lip, the inner side of which is very prominently denticulated.

South of Pakiri Beach is a long stretch of rocky coastline which extends past Goat Island and Cape Rodney to the harbour of Leigh. Between Pakiri and Goat Island are two sandy inlets: Te Rere Beach and Kempt's Beach. The latter has proved a good place to find X. labiatum, which is washed ashore after storms, though usually the shells are damaged. However, I have been lucky enough to recently find two specimens in good order. One is immature, and was discovered with the animal and operculum intact, while the other, though empty, is an adult in perfect condition. These are most atractive shells, more elongate than the pyrum series, and more exotically coloured. The protoconch and spire whorls have a reddish-pink tinge which distinguishes them at a glance.

In the same locality, X collactea is sometimes found. This species is slightly more globular than labiatum, has a thinner, almost white, though dentate outer lip, and a well-defined row of nodules on the last half-whorl. Live specimens have labiatum colouring, but old shells fade until they look more like pyrum specimen. Live ones washed up among the rocks after storms nearly always have the operculum missing.

Numbers of hybrids are found here too. These look like collactea, but have the thick and dentate lip of labiatum, while some others have the thin white lip and general shape of collectea, but are entirely devoid of nodules. Mr. Powell has mentioned that the collectea assemblage often have the radulae of labiatum.

It is interesting to note that these shells, during growth, usually dissolve the outer lip before proceeding further, but this does not always happen, so that many retain the lip in the form of a varix. Sometimes one sees two or three on one shell.

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COLLECTING AT THE BAY OF ISLANDS

by ROBERT L. MATTHEWS.

THE northern location of the Bay of Islands, combined with its configuration, provides a very optimistic prospect for a shell-collecting expedition.

That, and the reports that Pteronotus eos was to be found there proved sufficient lure for us. We had long wanted to find this beautiful murex, and on our projected holiday we determined to leave no stone unturned in our endeavours to locate at least one specimen.

We stayed at Paihia and one evening, as we were searching through the masses of shells, Mrs. Matthews remarked that we should come across a Dosinia greyi. She refreshed my memory with a description of the shell, but at the time I was intent on finding a Notocallista multistriata. Even a single valve would have satisfied me, and I was somewhat inattentive to her description. She left me to search elsewhere when there, where she had just been poking over the rubbish, was a perfect greyi. There was no mistaking the difference between this shell and lambata.

The concentric striations are deeply marked, somewhat laminated and unevenly raised. Also the ventral margin is deeper than D. lambata and the valves more inflated. Finally there was a difference in the colouring. I called Mrs. Matthews, and she was as delighted as if we had found an Eos. Later we found several single valves of greyi, and a small whole shell that is doubtful. Collecting is fun. I am still seeking my N. multistriata.

Later, on that beach we found an empty Zeacolpus vittatus in good condition.

Along the coast to the north lies Brampton Reef, an immense stretch of boulders some two miles long and about half a mile out at low water. We had been advised that there was a good bay, Onewhero, beyond Brampton Reef, where there were plenty of shells. We had endeavoured to get there in our car, but we found that where the road reaches the coast it continues on over the rough rocks of the reef. We decided not to risk our car on the road and to spend our time on the reef. Fortunately the tide was receding and our first vist there was an exceptionally low tide. We followed the tide out, and found the reef a very profitable hunting ground.

At varying tidal levels we came upon the different shell families. For instance, at high tide mark in the brackish sludge were masses of Ophicardelus costellaris, and farther out the Arca novaezeladiae were in plenty. Then we came to the Buccinulums and Cominellas. These latter were of such variety and colour that we wished we possessed a more detailed knowledge of the family, because it was evident that here were good samples for study.

The mussel Modiolus areolatus was there, also good live specimens of Maoricolpus roseus. Also Paratrophon stangeri and Buccinulum heteromorphum in a surprising variety of sculpture patterns.

At this tidal mark we also came upon Murexuls that at first glance we thought were juvenile octogonus, for there were so many of them. However, on a more careful examination, we decided that they were the rarer Auporian type mariae (Finlay). We could hardly believe our good fortune and collected all we could find for distribution to fellow club members.

There were exceptionally good specimens of Chlamys at this tidal level and one dirty-looking individual revealed himself on cleaning to be A.c.zeelandona.

Here I should mention that the whole area of the reef is covered with a dirty silty slime, making searching for shells very difficult. On turning over a boulder the fine silt would cloud the water, settling all too slowly. Also, the shells on the rocks were so encrusted with silt and dirty weed that they were almost indistinguishable. One's eyes became tired with concentrating.

At low tide we were really hard at work, and our arms and backs began to feel the strain of heaving over boulders. But our efforts were well rewarded. Amongst hundreds of Neothais scalaris was an old empty shell, with a more depressed spire than scalaris and altogether more solidly constructed. Consulting with Mrs. Matthews, we decided that it was not scalaris and worth keeping. Later I found a younger, cleaner specimen, and it was evident that it was different to scalaris, yet a neothais. Well it could only be a smithi, and that was confirmed for us by Mr. Elwyn Richardson, whom we met later.

But there was no mistaking the Agnewia tritonifornus. There he sat perched on a rock waiting for me to take him. I have often thought since that it was something like Stanley meeting Livingstone.

Collectors can quite understand that with these finds I was quite excited. I called to Mrs. Matthews, but she was very busy taking

Daphnella cancellata. She seems to find most of our Daphnellas, whereas I am lucky with Chlamys.

At dead low water we took Buccinulum lineum and multilineum Powell. With these we found to our great delight a couple of B. multilineum aupouria Powell. All the lineums were encrusted with the silt peculiar to the place, but the aupouria were clean specimens.

Also to be mentioned among our finds on this reef were a couple of Zemyllita stowei and Marikellia rotunda. We also came upon two small empty Cleidothaerus maorianus still attached to the rocks. Inside each of these, smugly tucked away, was a small live, Maorikellia rotunda.

With this variety of collecting we consider that Brampton Reef is the best hunting ground we know, even surpassing the Mount rocks at Tauranga. We gladly pass on this information to fellow club-members.

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TWO STORMS IN MERCURY BAY

by DOROTHEA D. STOCKER.

On May, 1947, there occurred a prolonged heavy south-east gale, just at the time of the spring tides. On the last day of the storm, the tide was very high, and with but little more to go, would have inundated the township of Whitianga, or at least that part of it alongside Buffalo Beach.

Next morning, the wind having dropped, and there being but little rain, many people took a stroll on the shore, as everyone loves to do after a great storm and tide, and were lucky enough to find a number of Tonna haurakiensis had come ashore alive. You may well imagine that these were not returned to their native element.

We were not among the fortunate ones, as we could not go till the afternoon; however, we got two or three good ones, and were given a couple more.

Buffalo Beach is about two miles long, and that afternoon it was an astonishing sight. For the whole length of the beach at high water mark there was an unbroken line of Panope zelandica. With very few exceptions, the fish were still in the shells, with their long siphons hanging out, encased in a sheath resembling yellow suede. They were beautiful specimens, many being of a soft creamy shade, not as large as and much smoother than the occasional specimens one finds washed up, which are usually very large, thick and rugged, and rather coarse-looking.

We found about 40 Offadesma angasi, ranging from a tiny young one, very delicate and perfect, to large ones, the largest one being 78 by 49 m.m. There were also many Zenatia acinaces and Resania lanceolata, and a fair number of Angulus spenceri. We made a goodly haul, and cleaning the shells was quite a business.

All this was probably the result of a "scouring" tide having washed a sand bank away, as rocks were exposed which had not been seen for many years.

About two and a half years later, there was another fierce south-east gale, and again a vast number of the same species of shells, with the exception of the Tonnas, was washed ashore. Another sand bank must have been scoured away, but in a different locality, as the Panopes were greyish instead of cream-coloured, and not so pleasing to look at. The Offadesmas were smaller on the average than the first lot, and in addition to these differences, an enormous amount of sea-life was thrown up by the tide, to the joy of the feasting seagulls. There were great mounds of pink sausage worms, thousands of mantis shrimps, heart urchins, starfish and many other creatures not usually seen on Buffalo Beach, including an endless line of octopi, not all small ones by any means, and, alas! for the poor fishermen, scores upon scores of dead crayfish from the tanks near Front Beach, which were smashed by the storm.

Front Beach itself was stripped of sand in a very curious way, and then heaped with mounds of kelp, among the wrack being many fine Haliotis iris, Maurea tigris and other beautiful marine shells.

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COLLECTING PLACOSTYLUS IN WINTER

by B. S. BIRD.

On May 7th, 1951, I flew to Kaitaia and joined up with a friend, Charlie Mountfort. We left Kaitaia at 3 p.m. on Monday and motored up the Ninety Mile Beach in an Austin 7. The beach was firm and smooth and the car slowly accumulated a speed of about 45 m.p.h., which is fast for the size of the car. Not having seen each other since the previous year, Charlie and I had a great yarn and did not notice a large stream running out on to the beach. We were on it before we knew. A wall of water swept over the car, the doors flew open, I hit the roof, and we were out on the other side—no casualties. We hit another just above the Bluff when we started to talk again, and although no car could normally stand this, ours did and we reached Te Paki Station exactly two hours after leaving Kaitaia. As it was only 5 p.m., we decided to camp at Spirits Bay, 14 miles further on. It took us 1½ hours to cover that distance. The clay road was very slippery, and on one occasion we skidded into a waterhole on the edge of the road; however, the car was small and light, so we managed to lift it back on to the road and continue.

Tuesday morning we woke up very wet, as one of the main pegs of our small hiker's tent had pulled loose and the tent sagged forward so that heavy rain during the night made things most uncomfortable.

We put on coats and decided to hunt for Placostylus ambagiosus keenorum in the patch of bush just above the mouth of the stream. The first flax bush I dived into I came out of very smartly—bitten by a spider. This nearly put me off, but I tried again and was soon almost pulling out bushes by the roots in unrivalled enthusiasm. I was delighted when Charlie found a live one; I had previously got one dead and soon found more live ones. A number of these were young so were released. We collected seven "takeable" shells in half an hour so I decided to go after subspecies spiritus. Incidentally, Rhytida duplicata vivens was abundant; one was found out on the end of a flax leaf. A patch of bush lower down, reputed to have no Placostylus in it, soon proved to be a good spot, as in less than ten minutes, five living specimens were found, three of which were takeable. There were many dead young ones under the flax.

About a mile and a half along the beach, among the dunes, we had no difficulty in finding the subfossil spiritus. I picked up a Janthina globosa just past the river mouth.

After a quick lunch we headed for the rocks, as the tide was low. Where there is good fishing water, I cannot resist a cast, but was out of luck—I got all the bites and Charlie got all the fish; two nice schnapper and two big kahawai.

The rocks were disappointing, the only shells of consequence being Maurea punctulata and Zeatrophon ambiguus. I also picked up on the beach two specimens of Baryspira australis, which were were very depressed and heavily calloused.

Shell sand among the rocks yielded—

Marginella pygmaea.
Marginella vailei.
Liratilia sp.
Odostomia sp.
Neoguraleus huttoni.
Marginella mustelina.
Retusa cookiana.
Evalea sp.
Rissoina zonata.
Pervicacia mariae.

In a rock pool I found a specimen of the rare Agnewia tritoniformis; in the river near the mouth, Melanopsis trifasciata, and on the beach Mayena australasia and Pupa sp.

The following day we climbed Unuwhao on our way to Tom Bowling Bay. After about half an hour collecting P.a.annectens, we secured five good specimens and two not so good but takeable. Young specimens were abundant and two specimens of Paryphanta watti were taken. This spot was only about 40 yards off the edge of the bush. After lunch at the summit, we set off and followed a track till we could see a beach which was cut off from Tom Bowling Bay by a rocky headland. We decided to risk getting round this headland and climbed down onto the beach where there were numerous Cabestana boltentiana, but all were broken. Washed up were a few good specimens of Astrea heliotropium.

We got around the rock easily and camped at the western end of Tom Bowling Bay.

Subspecies watti was abundant in the dunes right along the full length of the beach. Some pie melons growing in the sand we tried to cook, but they were not palatable boiled. The following day we hunted for P.watti alive, but though we found the locality, we looked in the wrong spot. I had been told to look past a v-shaped river bed going out to North Cape, so having found a patch of bush, up in the river bed, we proceeded to tear up flax bushes on both sides of the river for about a mile up, but no Placostylus were to be found. A beehive was discovered, hanging on the under surface of the trunk of a great Pohutukawa tree, threequarters of a mile up the stream bed. We schemed for nearly an hour on how to secure the honey, but finally decided that without matches it was a dim prospect.

On the way back on the northern beach I picked up a chambered Nautilus and two Janthina globosa.

As there were too many mosquitoes for our liking, we packed up and went back to Spirit's Bay. The walking times were: Western end of Tom Bowling Bay to watti locality, 1½ hours; western end of Tom Bowling Bay to Spirit's Bay, 2½ hours, with packs.

Next day we went across to Cape Maria van Dieman. We visited Te Hapua—the most derelict place in New Zealand, next to Port Craig. At Taputaputa Bay, I was lucky to collect 35 good specimens of the subfossil P.a.lesleyi and one Janthia globosa.

Mr. Schoefield, of the Cape Reinga Lighthouse, was very hospitable and let us spend the night in the P.W.D. bach there. Next morning, in an easterly gale and heavy rain—1½ins. between 7 a.m. and 10 a.m.—I left Cape Reinga for Cape Maria.

It took 1½ hours to reach the Cape, but I did not hurry, and collected on the way across—

Verericardia reinga.
Zegaleris tumens.
Pallium convexus.
Gomphina maorum.
Cardita brookesi.
Monodilepas diemenensis.
Chlamys zelandiae.

At the Cape I found subsp. worthyi abundant; subfossil in the sand dunes on the slope right at the Cape. Subsp. consobrinus was not so common, only five being collected. Three of these were good specimens, one having the epidermis intact. The animal had not been dead long, so consobrinus must be alive there somewhere. The colour seems to be a cross between ambagiosus proper and the annectens type—darker than the ambagiosus, yet lighter than annectens. The apertural colouring is lighter than annectens, but darker than ambagiosus.

Next to be collected was priscus. These were abundant in sand on the summit of the hill to the south of the Cape. Rhytida duplicata was also very abundant.

The Twilight Beach variety was yet to be collected, so I set off. Again I misinterpreted instructions and went too far down the beach. When I did break off into the dunes I found nothing and zig-zagged down to the southern end before coming out on to the beach again. Here I found another chambered Nautilus, Janthina globosa and J.violacea; otherwise the beach was bare.

I went back into the sand dunes, where I had first gone in and zig-zagged north, finally reaching the locality, which is only half a mile from the north end of the beach. To get back to Cape Reinga, I cut inside the big hill at Cape Maria and crossed an extensive swamp, coming out at the mouth of the stream running out on Te Werahi Beach. This stream was well up with the heavy rain, and I had difficulty in crossing. I was very glad to get back and into dry clothes.

Next day we had a search in a patch of poor bush east of Cape Reinga, going on the Lighthouse Keeper's suggestion, but there was nothing there and at midday we set off again for Kaitaia.

On the Ninety Mile Beach I picked up Verconella appressa. The heavy rain had washed out the sand into huge fans on the beach, making going difficult. About seven miles south of the Bluff the motor stopped—no petrol. Travelling in third gear on the bad roads had been heavier on our petrol than we had anticipated. We had an emergency tank of ¾-gallon, which took us the 30 miles to Waipapkauri turnoff. When we got there the car was going forward in lurches and we were lucky that we did not have a long walk.

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MINUTE GEMS FROM SEAWEEDS UNDER STONES AND SHELL SAND

by A. K. HIPKINS.

IN my last article in Bulletin No. 5 of this Club, I suggested ways and means of collecting this type of material and how it should be treated. A list of the localities and known habitats of many species were given. Before giving a further list I wish to make two amendments to the previous one.

AMENDMENTS:

On seaweeds, low tide, Leigh—

Schismope lyallensis: Now found to be new species of Sinezona. Finlay, 1926 (common).

Orbitestella vera: Now Orbitestella toreuma, Powell.

FURTHER SPECIES FROM LEIGH:

On seaweeds, low tide—

Zelaxitas: Finlay, 1926, new species (common).
Larochella toreuma: Powell, 1927.

Under stones, inter-tidal zone—

Pronucula: Hedley, 1902. New species (common).

SPECIES FOUND IN SHELL SAND:

Locality: Tryphena Bay, Great Barrier Island—

UNIVALVES:

Scrobs hedleyi: Suter, 1908.	Check list Reference No.	695.
Scrobs ovatus: Powell, 1927.	„	697.
Scrobs elongatus: Powell, 1927.	„	698.
Scrobs rugulosus: Powell, 1930.	„	699.
Scrobs semen: Odhner, 1924.	„	700.
Larochella alta: Powell, 1927.	„	726.
Lodderia iota: Powell, 1940.	„	423.
Lodderia waitemata: Powell, 1940.	„	424.
Larochea miranda. Finlay, 1927.	„	847.
Munditia tryphenensis: Powell, 1925	„	413.
Promerelina crosseaformis: Powell, 1926.	„	639.
Merelina superba: Powell, 1930.	„	631.
Orbitestella toreuma: Powell, 1930.	„	479.
Schismope lageus: Finlay, 1926.	„	312.
Cylichnina thetidis: Hedley, 1903.	„	1388.
Estea impressa: Hutton, 1885.	„	594.
Estea simplicata: Powell, 1927.	„	598.
Incisura lytteltonensis: Smith, 1894.	„	298.
Leuconopsis obsoleta: Hutton, 1878.	„	1454.

BIVALVES:

Condylocardia concentrica: Bernard, 1899.	„	140.
Condylocardia crassicosta: Bernard, 1896.	„	141.
Benthocardiella obliquata: Powell, 1930.	„	145.
Lima sydneyensis: Hedley, 1904.	„	92.
Myadora boltoni: Smith, 1880.	„	287.
Myadora novaezelandiae: E. A. Smith, 1880.	„	289.

The last three mentioned were half valves, the others being complete.

OBITUARY

We greatly regret the passing of several members this year: Mrs. J. G. Smith, Dunedin; Mrs. E. Whyte, Auckland; Mr. Hadfield, Takaka, and Mr. A. C. O'Connor, Wellington.

Mr. O'Connor was always an ardent collector, his first interest being in native birds. His fine mounted collection is now in the Canterbury Museum. Insects next claimed his interest, particularly Coleoptera, of which one of our finest species has been named after him. This collection was presented to the Dominion Museum. During the past 10 years or so this enthusiast took on a new interest—the land snails of New Zealand, and collected over the length and breadth of the country. He was instrumental in finding a number of new species, and wrote a paper on Paryphanta eggs. Mr. O'Connor was for many years a widower, but many members of the Club have partaken of his hospitality, a ready welcome always being found at 32 Grant Road. He had several sporting interests, including shooting and fishing, and it was the latter that actually caused his untimely death.

NEW ZEALAND MOLLUSCAN LITERATURE

by ELWYN RICHARDSON.

THE difficulty of collecting a workable literature on our New Zealand mollusca is great, and this list of works and where to get them may help the serious worker.

1. *Transactions of the N.Z. Institute & Royal Society of N.Z.:*

Members of the Society may purchase volumes at reasonable prices, but many are no longer available. Vols. 58 and 59 are very rare indeed; however I was fortunate in purchasing a volume of each from Kealy's second-hand shop in Shortland Street, Auckland, where volumes usually sell for from 10/- to £2.

2. *Proceedings of the Malacological Society (London):*

Separates may be purchased for 10/- each from the Secretary, Dr. Cox, British Museum, Cromwell Road, London. Members of the Society are allowed a reduction on this price. New Zealanders will need Vols. 15, 16, 17, 20 and 21, for papers by Powell, Marwick, Oliver, Ashby and Finlay.

3. *Records of the Auckland Museum:*

Vol. 1 is now unprocurable, but members of the Institute and Museum may purchase Vols. 2 and 3. Most of Mr. A. W. B. Powell's recent papers are included here.

4. *Records of the Canterbury Museum:*

Vol. 3, pps. 43-51; Vol. 3, pps. 113-124; Vol. 3, pps. 371-376; Vol. 4, pps. 29-39; are the parts that contain Mr. Powell's papers. It is not known if the museum still has separates for sale. It is thought not.

5. *Suter's Manual of N.Z. Molluscs and Atlas of Plates:*

The Government Printer has no further copies for sale. Both were valued at 10/6 each, but now their value has doubled for the plates, although the Manual can still be purchased from the second-hand dealers for the 10/- and even less.

6. *Paper's Mortensen's Pacific Expedition, No. 19, pps. 1 - 8.*
by N. H. Odhner.

The Rik's Museum, Copenhagen, is supposed to be the only source of this publication.

7. *Records of the Australian Museum, Sydney, Australia:*

1919. "A Review of the Australian Tun Shells," Hedley, Vol. 12, 329-336.

1925. "Mollusca from the Continental Shelf of East Australia," Iredale, vol. 14, pps. 243-270.

1927. "A Review of the Australian Helmet Shells," vol. 15, pps. 321-354

1936. Australian Museum Notes, No. 1, vol. 19.

1937. "Notes on Neozelanic Deep-water Marine Mollusca," vol. 20, No. 2, pps. 103-107. These last all of T. Iredale.

Vol. 12	£1 11 0	Vol. 13	£1 8 0
Vol. 14	£1 15 0	Vol. 16	£1 10 0
Vol. 17	£1 11 0	Vol. 19	£2 0 0

8. *Volumes of the Australian Association for the Advancement of Science:*

The General Secretary, Science House, 157 Gloucester Street, Sydney, has these for sale for 15/- per volume.

9. *Proceedings of the Linnean Society, N.S.W.:*

Available from the Science House Secretary also.

10. *Royal Zoological Society of New South Wales:*

The Australian Zoologist.

"The Loricates of the Neozelanic Region, vol. 4, pps. 305-323; vol. 6, pps. 75-95, pps. 157-168; vol. 7, pps. 59-76 and pps. 119-164, all of T. Iredale, Hull, A . F. Bassett.

The separates that make up this section of our conchology may be purchased from the Secretary of this Society, Box 2399MM, G.P.O. Sydney, Australia. The Australian Loricates are also sold by this Society.

11. *British Museum Publications:*

E. A. Smith. "Terra Nova" British Antarctic Expedition, Natural History Report. Vol. 2, No. 4, pps. 61-112, 4/-.

A. L. Massey, Ibid. Vol. 2, pps. 141-173, 3/-. Vol. 2, No. 9, pps. 203-232, 7/6.

N. Odhner, Ibid. Vol. 7, pps. 229-310, Nudibranchia, 7/6.

T. Iredale, "Great Barrier Reef Report," vol. 5, No. 6, 15/-.

Catalogue of "Tertiary Mollusca" is out of print.

12. *Discovery Report, A. W. B. Powell (1937):*

Issued by the Discovery Committee, Colonial Office, London, and printed by the Cambridge University Press, is priced at 25/-.

13. *Bulletin of the Auckland Institute and Museum, No. 2:*

The New Zealand Recent and Fossil Mollusca of the Family Turridae, by A. W. B. Powell, 1942. May be purchased from the Museum.

14. *Geological Survey Bulletins, Government Printer, Wellington:*

"The Tertiary Mollusca of the Gisborne District," J. Marwick (14/5). "Geology of the lower Awatere District, Marlborough," King. "Lower Pliocene Mollusca from Otahuhu, Auckland," Bulletin No. 16, Marwick. These are the only Bulletins dealing with tertiary mollusca that the Printer has for sale. All Suter's Bulletins are now on the rare list.

15. *Shellfish of New Zealand, by A. W. B. Powell:*

Is purchasable from any book store in New Zealand and many in Australia and elsewhere.

16. *B.A.N.Z. Antarctic Research Expedition, Vol. 4, part 1:*

The Loricata section by Cotton is included in this separate and is to be had for five shillings odd from the Adelaide University. There is included a section by B. C. Cotton on Brachiopoda.

17. *1940 Supplement to the Check List of the Shellfish of N.Z. (1937), Auckland Museum Conchology Club:*

This and the Club's Bulletins are to be obtained from the Secretary, c/o the Auckland Museum.

18. *N.Z. Journal of Science and Technology:*

Obtainable for 2/- a copy from the Government Printer, Wellington.

Records of Dominion Museum:

Purchaseable from the Dominion Museum, Mr. R. K. Dell's recent papers are here included.

The papers concerning the recent fauna are listed in Mr. A. W. B. Powell's book, "Shellfish in N.Z., whereas those of the fossil fauna are included among the same literature and several Palaeontological Bulletins that are now not to be purchased unless second hand.

LIST OF MEMBERS—*continued*

Mitchell, Miss D. P.O. Huiroa, Stratford, Taranaki.	1.
Moore, Mrs. F. W. 97 Richmond Street, Thames.	1 to 4.
Moore, Miss L. B. 9 Hadfield Terrace, Kelburn, Wellington.	1 to 5.
Mouat, Mrs. M. 9 Queen's Parade, Devonport, N.1. Phone 71-686.	1 to 4.
Nevill, Mr. and Mrs. G. F. Port Charles, Coromandel Peninsula.	1, 3.
O'Connor, A. C. 32 Grant Road, Wellington.	, 3.
Paul, W. J. 6 Monaghan Avenue, Karori, Wellington.	1 to 4.
Penk, J. B. 85 Beach Road, Howick.	1.
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Smith, Mrs. C. P.O. Box 39, Halfmon Bay, Stewart Island.	1, 3.
Smith, F. J. 16 Hutton Street, Otahuhu, S.E.7.	1 to 4.
Stocker, Mrs. V. Kuaotunu, R.M.D. Whitianga, Mercury Bay.	1, 2.
Sutton, E. 30 Rodney Street, Invercargill.	1 to 5.
Swinbourn, Miss J. A. c/o Agricultural Dept., Box 2298, Wellington.	1, 3.
Thomson, Mrs. W. P. 15 Hillsborough Road, Onehunga, S.E.5.	1 to 5.
Thompson, K. Huia Dam, Auckland.	1 to 5.
Trigange, Mrs. Ron. Ormsby Street, Temuka, South Canterbury.	1, 3.
Voss, A. S. McLaren's Falls Power Station, Lower Kaimai R.D., Tauranga.	1 to 5.
Warren, T. P. P.O. Box 2, Leigh, North Auckland.	1, 2.
Walker, J. R. 500 Queen Street, Auckland, C.1.	1 to 4.
Way, Mrs. G. B. c/o Epsom Girls' Grammar School Hostel, 21 Owen's Rd. Epsom, S.E.3.	1, 3.
Whyte, Mrs. E. 38 Campbell Road, Onehunga, S.E.5.	1 to 4.
Williams, E. G. Pitau Road, Mt. Maunganui.	1.
Williams, Mrs. H. 33 Wexford Road, Kilbirnie, Wellington.:	1 to 5.
Wilson, Mrs. M. E. 31 Oliver Street, Point Chevalier, W.3.	1 to 5.
Willis, E. 460 Queen Street, Auckland, C.1.	1 to 5.
Wise, K. 'Five Oaks," Favona Road, Mangere, Auckland.	1, 3, 5.
Wyatt, Mrs. J. 220 Richmond Road, Grey Lynn, W.2.	1 to 5.

1. N.Z. Sea Shells. 2. Foreign Sea Shells. 3. N.Z. Land Shells.
4. Foreign Land Shells. 5. Fossils.

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AUCKLAND MUSEUM CONCHOLOGY CLUB

BULLETIN No. 8

AUCKLAND, NEW ZEALAND

NOVEMBER, 1952

AUCKLAND MUSEUM CONCHOLOGY CLUB
BULLETIN NO. 8

EDITORIAL

INCREASING and continued interest in the Club is apparent in record attendances at monthly meetings, and the fact that more members have been enrolled this year than in any previous year.

Readers should learn a considerable amount from the interesting articles contributed to the Bulletin by members in various parts of New Zealand, and it is parrticularly encouraging to see that some members are carrying out extensive and detailed studies in their own areas. There is plenty of scope for this type of work and it is to be hoped that others will take it up.

At the suggestion of Mr. A. W. B. Powell, field days this year have been directed towards a survey of the molluscan fauna of the Manukau Harbour and trips have been made to several areas on the northern side. The excursions have been well attended, in spite of adverse weather, and a very good start with the work has been made. Ecological work must of necessity take some time to complete, so it is expected that the project will take several years, and that the eventual results will be published in a future issue of this Bulletin. Later it is hoped to start a detailed survey of the land mollusca of the Waitakere Ranges.

We wish to thank Mr. A. W. B. Powell for his invaluable help, and all those who have made this publication possible.

N. W. & E. N. GARDNER, *co-Editors.*
1st November, 1952.

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SHELLS FROM FISH

by E. G. WILLIAMS.

Notes on species of shellfish found in the stomachs of fish caught in Tauranga waters. including Mayor Island and the Islands of Motiti and Karawa.

TO MAKE use of fish as a medium for collecting shells at first sounds ridiculous, but when one considers that the ground-feeding fish live on the sea bottom, poking in and out amongst the rocks and seaweed in search of food, they have ample opportunity for picking up deep-water shellfish, which are often far too fragile to withstand the wear and tear of being washed up on a beach, and are also beyond the reach of a trawl on account of rocks.

Naturally the depth of water that the fish are caught in does not necessarily indicate the depth the shellfish inhabits, especially so when the fish are taken near land, but if the fishing ground is five or six miles from the nearest land it is a fair thing to surmise that the shellfish live at that depth.

Do fish take all shellfish found in their stomachs as food? I think not. Bivalves the size of a hazel nut and larger, and univalves over an inch in height quite possibly, but one can hardly believe that fish would take minute shellfish as food, especially as the bulk of the stomach's content consists of stones, gravel, sand and crustaceans. It may be that in grabbing up the larger shellfish the minute shells and rubbish are swallowed by accident.

I have taken from fish bivalves measuring 29mm. x 17 mm., and univalves up to 30 mm. x 18mm.

Some varieties of shellfish are widely distributed, being found on all fishing grounds, while others are strictly confined to their own areas and found nowhere else.

The preponderance of certain species of shellfish taken from fish caught on the different fishing grounds is an excellent guide as to which ground the fish were caught on, as the various reefs all differ to a certain extent in what they yield, and the same thing applies to the seasons; *i.e.,* in the month of June the fish may be taking a certain crustacean in great numbers, in January on the same ground hardly a crustacean is found in the fish.

During the years 1947-48-49 the fish were almost always full of shell matter; since then either the fish have changed their feeding habits or the fishing grounds have ceased to yield the shell food. To-day, 1951, very few shellfish are found in the fish, but the fact remains that the fish are still in excellent condition.

In the above years I caught and treated the stomachs of 2,961 Tarakihi, 66 Porae, 4 Moki, 96 Cod, and in addition, very nearly as many caught by my fellow fishermen.

How it began:

On April 3, 1947, when gutting fish on board the fishing launch "Eva," something hard rattled on the deck; on being inspected it proved to be a perfect specimen of Nemocardium pulchellum, rather a fragile shell seldom found on the beach in a perfect condition, showing the beautiful coral pink colouring.

Since that day the guts of thousands of fish have been collected and treated for shells, using a techinque which evolved as the experiment proceeded, and the results have amply justified the time and trouble expended on this method of obtaining deep water and fragile material which cannot be collected by combing the beaches.

By dredging on the open sea bottom deep water specimens are obtained, but in a great many cases the shells are dead.

The fish usually feeding amongst the rocks and seaweed pick up the shellfish and crustaceans in a live state; I have on one or two occasions placed the shells in salt water and known them to live for days; just to take one example: a Notocallista multistriata taken from a Tarakihi lived for 16 days.

Another great advantage is the fact that many of the shells, even the minute ones, retain the operculum and also the natural colours of the shells are preserved.

The most useful fish in the Tauranga waters:

SNAPPER: Although a partial ground feeder, is apt to crush shell matter with its powerful teeth; at the same time occasionally a perfect specimen is found.

MOKI: The rather rare fish on these grounds is one of the best collectors; it has the advantage of possessing a large mouth, roomy stomach and small teeth.

PORAE: Quite one of the best; in the Mayor Island waters during the summer months, it is plentiful, has the same advantages as the Moki, and grows up to 15lbs. weight.

TARAKIHI: This being the most plentiful fish caught on all the fishing grounds is the producer of the bulk of material, but it has the disadvantage of being a small fish and therefore is incapable of swallowing the larger shells.

COD: I have obtained shells from this fish, but not often.

Technique employed in the different branches of preparation:

Gutting the fish. The portion of gut containing shell matter is small when compared with the whole of the viscera and runs from the vent upwards; therefore when gutting begin at the vent and carefully remove that portion without rupturing the gut; obviously the remainder contains no shells and only hinders the next operation.

Running the guts. This sounds an unpleasant proceeding, but is in reality not so, if the guts are fresh and the following method is employed:

A large white enamel basin or some such vessel is essential; half-fill this with water, take the guts out one at a time and run them into the water; great care must be taken not to use force, as any very fragile shells may easily be crushed. When all the guts have been run, the next operation is the separation of all organic matter from the inorganic, and this is best done under a tap with a fair pressure, the water helping to break up any tissues containing shells; the top water is then carefully run off, taking with it all floating material. Continue to do this until the water that runs off is perfectly clear and only sand and shells remain in the dish; this takes time, as you may have to fill the dish fifty times before the desired result is achieved.

Drying the sand. Drain all the water out of the dish and place in the sun until everything is bone dry.

Grading the sand. It is obvious that it is futile to search for a minute shell amongst coarse material, therefore it is highly necessary to grade before beginning to search.

The sifting is easily and quickly done by means of three sieves of different mesh; two ordinary gravy strainers and a coffee strainer serve the purpose quite adequately.

The first or coarsest grade can be combed with the naked eye, but the second and third grades require a strong lens and a microscope; the fourth grade consists mainly of fine sand and may be discarded.

To find every shell in one session is almost impossible, especially amongst the finest grade, so it is quite a good plan to keep the sand in its different grades in tins and label as to date, location, and depth of water the fish were taken in, and repeat the process some wet day.

Results. To justify this means of collecting deep water material, I give results after three years' work. *Different varieties:* I have taken from fish some 347 different varieties of shells, some of which are naturally juveniles, as a Tarakihi could hardly be expected to swallow a full-grown Astraea heliotropium, a Longimactra elongata, or a Xenophora neozelanica.

New Species. As identified by Mr. A. W. B. Powell, of the Auckland Museum, 73. Specimens taken by Mr. Powell for the Auckland Museum, including all the new species, 110.

In conclusion I would like to express my grateful thanks to Mr. Powell who, though a very busy man, has devoted so much of his valuable time in identification of some 300 specimens for me; also Mr. Michael Hodgkins, of Tauranga, whose ever ready help and advice have been invaluable to me.

List of shells taken from the stomachs of 49 Tarakihi and 15 Porae, caught in 35 fathoms, Tuhua Reef, Mayor Island, 29th April, 1948:

Only unbroken shells were counted, and bivalves counted as a half, unless complete; most of the shells were quite fresh, showing the natural colours, and some were still alive.

Total Shells .... 1583.
Chiton valves .... 1169.
Different species ...... 155.

The Chitons were of three varieties:
Anthochiton canaliculatus.
Craspedochiton rubiginosus.
Acanthochiton zelandicus.

In the case of the shells, quite a number of the larger species were juveniles, and most of the Chitons were immature.

Aclis terebra	1
Agatha georgina	1
Alcithoe fusus	1 juv.
Alcithoe juveniles	5
Antimelatoma buchanani maorum	2
Aoteadrillia rawitensis	1
Aoteatilia, new species	2
Argalista nana	47
Austrofusus glans	3
Austromitra pseudomarginata	2
Austromitra rubiginosa	4
Balcis oxyacme	2
Baryspira mucronata	3 juv.
Baryspira novaezelandiae	4
Brookula corolum	21
Cantharidella tesselata	1
Cirsonella, new species	3
Cirsotrema zelebori	1
Cominella juveniles	9
Cominella quoyana	7
Cosa costata	211
Costokidderia lyallensis	1½
Crosseola cuvieriana	1
Cyamiomactra problematica	1
Cylichnina thetidis	2
Dacrydium radians	6
Daphnella cancellata	30
Dardanula roseola	234
Dentalium ecostatum	5
Dolicrossea vesca	1
Elachorbis sub-tatei	2
Epicodakia, new species	½
Epitonium phillippinarum	1
Estea impressa	87
Estea zosterophila	32
Eulimella tenuiplicata	1
Fautor, new species	2
Finlayola lurida	1
Fossarina rimata	11
Gari stangeri	11
Glycymeris laticostata	2 juv.
Glycymeris modesta	46
Gumina dolichostoma	4
Gumina minor	2
Hebeseila bulbosa	2
Herpetopoma bella	24
Herpetopoma larochei	3
Herpetopoma, new species	6
Hunkydora transcenna	1
Ividella maoria	2
Joculator dirempus	2
Lilax nucleogranosum	2
Limatula maoria	17
Linemera gallinacea	1
Linemera pingue	2
Linopyrga rugata	1
Liotella indigens	2
Liotella polypleura	2
Liratilia conquisita	11
Liratilia compta	2
Lodderina formosa	2
Lodderia iota	6
Lyroseila chathamensis	4
Macrozafra, new species	1
Maoricolpus roseus	10
Maoricrypta costata	2
Maoritomella multiplex	1
Marginella aoteana	3
Marginella fusula	3
Marginella hebescens	1
Marginella mustelina	3
Marginella pygmaea	3
Marikellia rotunda	11
Maurea tigris	1 juv.
Merelina compacta	26
Merelina taupoensis	2
Merelina, new species	1
Micrelenchus rufozonus	10
Modelia granosa	2 juv.
Monia zelandica	1 juv.

Murexsul mariae	22
Murexsul octogonus	6 juv.
Myodora boltoni	2
Neoguraleus murdochi	3
Neoguraleus oruaensis	1
Neoguraleus sinclairi	4
Nepotilla nitidula	1
Nilsia, new species	4
Nobolira finlayi	2
Nobolira, new species	2
Notoacmea subtilis	7
Notocorbula zelandica	8
Notoscrobs ornatus	2
Notoseila terebelloides	2
Notosetia infecta	12
Notosetia micans	26
Notosetia unicarinata	3
Notosetia, new species	1
Notosetia, new species	3
Notosetia, new species	3
Notosinister ampulla	10
Notosinister fascelina	13
Notosinister infelix	16
Notovola novaezelandiae	12 juv.
Orbitestella toreuma	2
Pallium convexum	6 juv.
Paraclanculus peccatus	1
Peculator hedleyi	6
Perrierina, new species	1
Philine auriformis	9
Philine auriformis gizzard plates	35
Philine constricta	2
Pleuromeris hectori	1
Pleuromeris paucicostata	4
Pleuromeris zelandica	18
Pleuromeris, new species	10
Promerelina crosseaformis	1
Proximitra obscura	5
Proxiuber australis	8
Proxiuber barrierensis	2
Rissoina achatina	9
Rissoina chathamensis	8
Rissoina rufolactea	5
Rissoina zonata	9
Rochfortula reniformis	11
Schismope laqueus	2
Scissurona rosea	7
Scrinium neozelanicum	6
Scrobs hedleyi	9
Sinezona brevis	2
Socienna maoria	1
Splendrillia aoteana	1
Tectisumen clypidellaeformis	2
Terebratella inconspicua	157
Teretianax pagoda	2
Thoristella carmesina	7
Trichomusculus barbatus	2
Trichosirus inornatus	1
Tugali elegans	6
Tugali suteri bascauda	2
Typhis pauperis	1
Venericardia purpurata	2 juv.
Veprecula cooperi	1
Vermetidae juveniles	9
Xymenella pusilla	6
Zegalerus tenuis	9
Zalipais lissa	1
Zaclys sarissa	13
Zeacolpus fulminatus	2
Zeatrophon ambiguus	2
Zeminolia plicatula	1
Zeminolia tryphenensis	1
Zemitrella chaova	20
Zemitrella pseudomarginata	1
New genus?	1

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STEWART ISLAND MOLLUSCA

ADDITIONS TO THE 1939 LIST OF POWELL.

By E. K. A. SMITH, *Halfmoon Bay, Stewart Island, Aug. 1952.*

THE following list is of species examined, and, except in a few cases, held by me at Stewart Island. A great deal of work entailed has been made possible by the kindness of those who have brought me specimens and sea-bottom, and by the indefatigable collecting of Miss Olive Allan. My thanks are due also to Mr. Powell and Mr. Dell, for help in naming specimens; and to the directors of the Canterbury and Dominion Museums, and of the Geological Survey Department, for allowing me access to material in their care.

In the accompanying map, the Island and surrounding waters have been divided into numbered sectors to be used with the following initials:—

C.L.: coastal land to half a mile inland; G.G.: fishing grounds, including Patterson's Inlet, F.G. 1—7 extending to 10 miles offshore; F.O.B.: Foveaux Straits oyster beds; F.W.: fresh water; L: land; O.S.: shallow offshore waters; S.: shore.

All fishing ground specimens, except where otherwise stated, were obtained from lumps of corallaceous sea-bottom, brought up on the hooks of fishing lines, in from 15 to 30 fathoms. Oyster-bed material ranged from 10 to 20 fathoms.

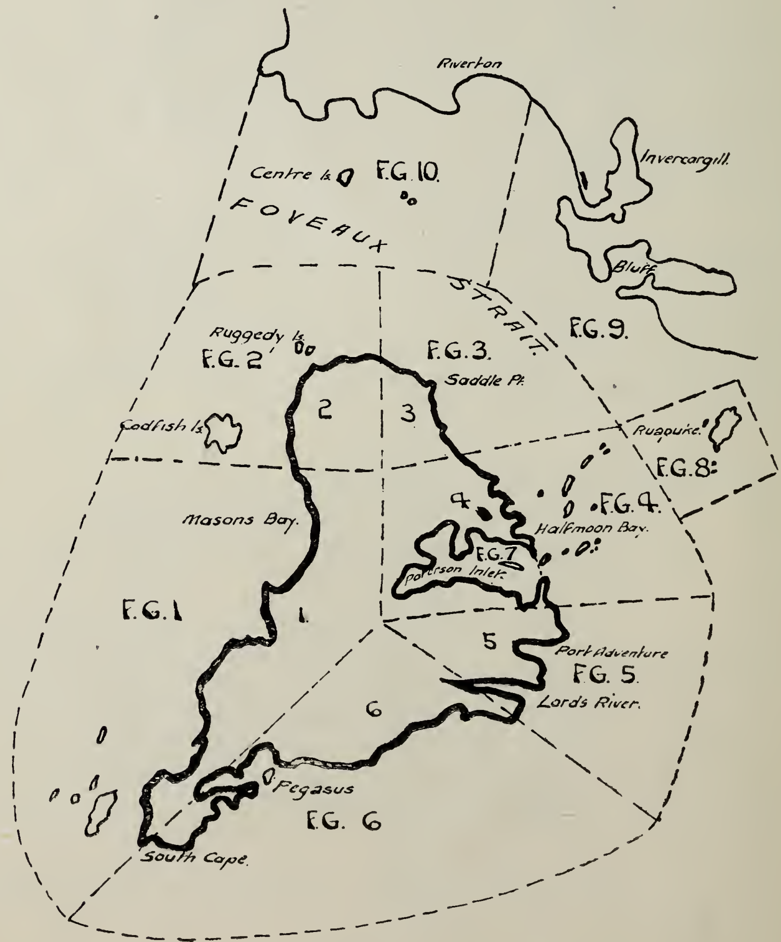
Habitat contractions:

$\frac{1}{2}$: half tide area; b: beach; b.d.: beach drift; h.: high tide area; l.: low tide area; m.: mixed; r.: rocks; s.: sand; s.s.: shell-sand; s.w.: seaweed; v.: very; w.: washings.

The numbers used are those of Powell's checklist, 1946, and an asterisk denotes: "not in my collection."

Map of

Stewart Island and Surrounding Waters.


Riverton
Invercargill.
Centre Is.
F.G. 10.
FOVEAUX
STRAIT.
Bluff
F.G. 9.
Ruggedy Is.
F.G. 2
F.G. 3.
Saddle Pt.
Codfish Is.
2
3
Ruapuke.
F.G. 8.
4
F.G. 4.
Halfmoon Bay.
Masons Bay.
F.G. 7
Paterson Inlet.
F.G. 1
1.
5
Port Adventure
F.G. 5.
Lords River.
6
Pegasus
F.G. 6
South Cape.

Pronucula sp.n.? F.G.2, 8 fths. August, 1948; F.G.4.

23 *Monia zelandica* Gray. F.G., F.O.B.

68 *Tricomusculus barbatus* Reeve. F.G. 2, 4; F.O.B.

71 *Dacrydium pelseneeri* Hedley. F.G. 1, 4—8, 5 (60 fths.).

Pecten novaezelandiae rakiura Fleming 1951, non *Pecten (Notovola) medius* Lamarck. O.S. 7.

Rock oyster. Cannot locate name.

Kidderia aupouria fiordlandica Fleming 1948. F.G. widespread, S. 4, s. under l.r., s.s.

Kidderia marshalli Fleming 1948. F.G. 4.

118 *Cuna carditelloides* Suter. F.G. 4.

143 *Condylocardia* cf *pectinata chathamensis* Powell. F.G. 2.

164 *Lasaea rossiana vexata* Finlay. S. 4, l.m.w., s.s.

171 *Packykellia concentrica* Powell. O.S. 4.

Mysella cf *henryi* Fleming 1948. S. 7, l.m.w., Golden Bay.

191 *Rochefortula reniformis* Suter. F.G. 4; F.G. 2 (8 fths.).

193 *Rochefortula taieriensis* Powell. S. 4, under bull kelp "holdfasts."

203 *Divariscintilla* cf *maoria* Powell. S. 4, s.s., May, 1947.

204 *Sphaerium novaezelandiae* Deshayes. F.W. 2, Lake on Ruggedy Flats (O. Allan).

230 *Amphidesma ventricosum* Gray. F.O.B.

231 *Amphidesma fosteriana* Finlay, non *A. subtriangulatum.* Wood. S. 4.

249 *Dosinula zelandica* Gray. F.O.B. (Mr. Hawea Thomson).

256 *Bassina yatei* Gray. S. 4. (O. Allan).

Panope smithae Powell 1951, non *P. zelandica,* Q. and G. F.O.B.

Scissurella stella Fleming 1948. F.G., widespread; F.O.B., trawled F.G. 5 area.

Scissurella aff. *stella* Fleming 1948. F.G., widespread; F.O.B., trawled F.G. 5 area.

320 *Emarginula striatula valentior* Finlay. F.O.B.

Mircelenchus caelatus bakeri Fleming 1948, non *M. sanguineus* Gray. O.S. 7, in s.w.

*378 *Micrelenchus micans* Suter. S. 4, b.d. (Pres. Dominion Museum).

393 *Venustas tigris* Martyn. F.O.B., F.G. 7.

Venustas pellucida fosteriana Dell 1950, non *Maurea waikanae* Oliver. F.O.B.

Munditia sp., aff. *owengaensis* Powell. F.G. 5, (60 fths.). April, 1948.

Lodderena nana pooki Fleming 1948. Widespread F.G.; F.O.B.; S, l.r.w.; s.w.w., littoral and trawled in 20 fths.

440 *Brookula* cf *corulum* Hutton. F.G. 4, May, 1949.

Zalipais sp.n.? S. 4, l.s.w.w., 1/5/49. Light brown shell.

Cirsonella cf *accelerens* Fleming 1948. F.G. 4, (8 fths.), August 1948.

482 *Argalista crassicostata* Murdoch. F.G. 4.

501 *Patelloida corticata corallina* Oliver. S. 4.

551 *Melarhaphe Oliveri* Finlay. S. 4, h.r.

Zelaxitas sp.n.? S. 4, l.m.w. Bathing beach, November, 1946. (A tall, narrow, blackish shell).

Zelaxitas sp.n.? S. 4. Lonneker's Bay, l.s.w.w. October, 1951. (Larger and with more convex whorls than *Z. rissoaformis* Powell.

601 *Estea rekohuana* Powell. S. 1, 4, l.r. and s.w.w.

675 *Notosetia retusa* Powell. F.G. 4, 5. F.O.B., S. 4, s.w.w.

676 *Notosetia simplex* Powell. F.G. 5.

677 *Notosetia gradata* Suter. F.G. 5.

711 *Dardanula limbata* Hutton. S. 7, s.w.w. F.G. 4.

753 *Potamopyrgus spelaeus* Frauenfeld. F.W.7, Golden Bay, in creek moss.

793 *Notosinister* cf *fascelinus* Suter. F.G. 4, January, 1952.

829 *Maoricrypta monoxyla* Lesson. S. 4. F.O.B.

830 *Sigapatella novaezelandiae* Lesson. S. 4. F.G. general. F.O.B.

837 *Proxiuber australis* Hutton. F.O.B.

847 *Larochea miranda* Finlay. S. 1, s.s. (O. Allan).

869 *Mayena australasia* Perry. F.O.B. (Mr. Hawea Thomson).

886 *Janthina (Iodina) exigua* Lamarck. S. 1. (O. Allan).

911 *Zerotula bicarinata* Suter. F.G. 4.

947 *Besla subrugata* Powell. F.G. 5.

*949 *Evalea sabulosa* Suter. F.G 4. (O. Allan).

997 *Pyrgiscilla otakauica* Laws. S. 4, s.s.

Eucominia sp.n.? S. 4, b.d., Ringaringa, 1948. (O. Allan).

1109.1 *Eucominia nassoides foveauxana* Powell. F.O.B.; F.G.

1136 *Zeatrophon pulcherrimus* Finlay. F.O.B.; F.G. 5 (60 fths.).

1144 *Axymene corticatus* Hutton. S. 4, 7. On sides of v.l.r. (O. Allan).

Comptella sp. ("Close to devia." Finlay, 1926). F.G. 4.

1167 *Lepsiella scobina rutila* Suter. S. 7, h.r.

1180 *Zemitrella chaova* Reeve. Widespread. S. F.G., F.O.B.

Paxula sp. aff. *paxillus* Murdoch. S. 4, 7, l.r.w. and kelp "holdfasts," 20/11/49 (O. Allan). A largish bright brown shell.

1291 *Phenatoma novaezelandiae* Reeve. S. 1, 4, b.d.

1302 *Scrinium neozelanicum* Suter. F.G.; S., s.s.

1312 *Neoguraleus finlayi* Powell. F.O.B. 9/6/52.

1318 *Antiguraleus* sp. F.G. 4, April, 1952.

1330 *Liracrea* cf *odhneri* Powell. S. 1, 4, s.s.

Austrodiphana sp. S. 1, s.s. November, 1949. (O. Allan).

1404 *Bouvieria ornata* Cheeseman. S. 4, under l.r. (D. Tait).

1417 *Archidoris* cf *violacea* Bergh. S. 7, ½ r., 12/1/52. (O. Allan).

1456 *Amphibola crenata* Martyn. S. 4, 7. Estuarine flats.

* *Flammoconcha stewartensis* Dell, 1952.L. 4. Fern gully. Unique type, coll. O. Allan, in Dominion Museum.

Obanella allani Dell, 1952. L. 4, 7. In leaf mould.

NOTOPLAX CUNEATA (SUTER)

SOME FURTHER REPORTS.

1. *by* A. K. HIPKINS.

To THE finding of three specimens the writer is much indebted to Mr. P. T. Warren, who first discovered the presence of the species on the sand flats at Whangateau Harbour, Leigh.

The find was really quite accidental, as we were at the time collecting *Baryspira australis*, whose trails were more numerous than I had ever seen before, but on this occasion, instead of picking up Baryspira, we found this beautiful chiton, which is unique in its habitat, and interesting for its close association with baryspira, and its almost identical trail. Cominella adspersa and C. glandiformis were also found among them.

2. *by* A. H. JONES.

While holidaying at The Mount, Tauranga, recently, the writer noticed dead Notoplax cuneata washing in on the top of the tide. Over a period of four days over 200 specimens were collected on the one area of about 300yds. of beach. There did not seem to be any reason for the calamity which had caused such toll of this prized item.

Notes of interest by A. H. Jones:

The South Island *Buccinulum sufflatum* was recently found alive at Wainui Beach, Gisborne.

While fishing at Whatipu, the writer was fortunate in finding the rare *Cabestana bolteniana* in a rock pool. A hermit crab made its home in the shell, which probably would account for its presence in the shallow pool.

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AUSTROSUCCINEA ARCHEYI (POWELL)

AT MOUNT MAUNGANUI

by WILLIAM P. THOMSON.

HAVING collected living specimens of this very interesting land snail on the sand dunes at Tokerau Beach, Doubtless Bay, in January, 1949, the writer was very interested, when on a short visit to Mount Maunganui in October, 1950, to learn from Mr. Gordon Williams there that some specimens had been found in that locality in 1947.

A search of the area at the time (October, 1950), with particular attention to conditions approaching those prevailing at Doubtless Bay, produced a single bleached and somewhat broken specimen. This was at least encouraging, seeing that a search made two months previously had failed to locate any specimens alive or dead (see "Life History of Austrosuccinea archeyi"—Powell: Rec. Auck. Inst. and Museum, Vol. 4, No. 1, p. 67).

However, on a second visit to the locality made in January, 1951, and under clear directions from Mr. Williams, the writer was successful in locating a small colony in the sand dunes at Omanu Beach about two miles along the coast from Mount Maunganui ocean beach.

They were found under a small patch of lupins which were likely to fall at any time to the axe of a beach-section holder, who was even then clearing some of the area to erect a fence. All the adjoining sections around were already built on, and it would be interesting to know if any have still survived the spoiling hand of the bach owners.

A search made during the same visit, some miles along the coast at Papamoa Beach Reserve, failed to locate any specimens there alive or dead.

It seems reasonable to assume that the rapid development of the Mount Maunganui district as an industrial area, and the Tauranga Harbour as an overseas shipping port, is likely to have its effect upon both the land and marine mollusca at Mount Maunganui.

A comparison between the Tokerau Beach and Mount Maunganui specimens is as follows:—

	Specs.	*Smallest*	*Average*	*Largest*	*Date*
Tokerau	36	4.50 mm.	8.44 mm.	12.25 mm.	Jan. 1949
Mt. Maunganui	21	7.00 mm.	8.40 mm.	10.25 mm.	Jan. 1951

The Mount Maunganui specimens are a little more globose, have not the same warm orange colouring, and are slightly more eroded than the Tokerau ones.

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VARICES ON CASSIDS

by W. J. PAUL.

IN THE last Bulletin, Mr. Warren mentioned the occurrence on Xenophalium collected about Leigh, of varices left on the shell at stages where the animal has neglected to dissolve the outer lip before proceeding with a new-growth stage. This habit was mentioned by Mr. Powell in his article on N.Z. Cassids, vol. 59, T.N.Z.I., and was also referred to by Dr. Bucknill in his book. One feature not mentioned by any of these writers however, is the fact that following the leaving of a varix the fresh growth stage has a different colour-pattern from the preceding one. I have collected on the beaches, from Paekakariki to Foxton, many specimens of X.pyrum showing a varix, and in practically every case it is noticeable that the growth stage following the varix does not display so clear a pattern. Generally the change consists of a dulling off of the general colour and the lack of spots. I have seen a number of variants of pattern which amount to a change from the normal pattern of a fawnish back ground with occasional spots in a band round the shell, to one of a plain brownish-fawn without spots. It is also observed that generally the fresh growth stage has not so highly polished a surface.

Mr. Powell has apparently looked upon the varix-leaving habit as having an hereditary background, but I think that the "habit" is perhaps more a matter of evidence of disease or some form of physical disability which has reduced the functional activity of the mantle. The reduction in clarity of the colour pattern and lack of polish on the shell surface would indicate some reduced vitality on the part of the animal, which has been unable, as a result of the same disease or disability, to produce the solvent to dissolve the outer lip of the shell. If this is true of my specimens, it probably also applies in other localities, though I have no material to judge by. Possibly other members have specimens which they can now examine with a critical eye. I have two specimens of X.harrisionae with varices on them from Mason's Bay, Stewart Island, but they were rather worn and it is not possible to say whether the behaviour has been the same in their case.

RECENT FOSSILS

FROM WELLINGTON HARBOUR.

by R. V. ROBERTS.

About a quarter of a century ago, the sea-wall in Wellington Harbour was completed. The suction dredge pumped thousands of tons of silt from the harbour bottom to reclaim the piece enclosed by the wall and many tons of shells were included in the material distributed.

Recently a power cable was laid in Aotea Quay, and many thousands of shells were brought to the surface by the electricians. Several times I looked over the heaps of debris and took a number of specimens for identification.

The following species have been identified:—

(1.)	Glycymeris laticostata.	(Q. & G.)
(2.)	Notovola novaezelandiae.	(Reeve)
(3.)	Amphidesma australe.	(Gmelin)
(4.)	Bassina yatei.	(Gray)
(5.)	Chione stutchburyi.	(Gray)
(6.)	Cookia sulcata.	(Martyn)
(7.)	Maoricolpus roseus.	(Q. & G.)

All of the above-mentioned are common species. The most common shell however, was number 7. Although hundreds of specimens were seen, they had the tip or protoconch missing in nearly every case. The older the shell, the more likely it was to be found minus the tip. The measurements taken of a series of 16 specimens showed a range from 30 x 12 mm. to 67 x 20 mm.

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ELLATRIVA MEMORATA

by K. P. WATENE.

A living specimen of our rare *Ellatriva memorata* Finlay, was found at Waihau Bay on 1st March, 1952. It was discovered in fairly calm water in a pool, sheltered beneath a high rock. The shell was not completely submerged in the water, and was quite covered by the flaps of the mantle.

Appearance: Foot transparent, with yellow veining visible, darker at either end of foot. Tentacles white, with dark spots. The siphon, also white, with dark spots, was interesting. Situated above and between the tentacles, it was usually in the form of a tube open down the front, but sometimes became opened almost out. The outer mantle had a velvety appearance, was orange, spotted with maroon, and somewhat transparent. White dots were distinguishable on the mantle at base of shell. There were two black eyes, one at the base of each tentacle.

The animal was kept vigorously alive for five days, before being sent to the Museum.

When touched the tentacles were withdrawn well to the side and under the body, unlike the garden snail, which can withdraw them into the head.

After placing specimen in a glass tumbler in an environment as near as possible to that in which it was found, but with perhaps too much water, the creature preferred to slide along the glass sides of its home to the surface of the water. Here it rested upside down, with its foot above the water. Twice it was pushed down purposely to the bottom, but each time it would travel back to the top. Sometimes its grip weakened so that it fell, but still the animal remained outside the shell.

Next day it was transferred to a shallow container, as when found. the specimen was not quite submerged. The dish was lightly tilted, so that there was deep and shallow water, but still the mollusc took up the same position as before. Aeration and the continual movement of waves were perhaps lacking, so the specimen was taken to the sea to let the waves roll over it—in its container. Occasionally it lost its grip and rolled over and over, but the mantle flaps were undisturbed, so perhaps it enjoyed this.

When it wished to change its direction of travel, the animal dropped the hinder end of the body, then slowly pivoted round ready to set off in the desired direction. If touched with anything sharp, the mantle flaps were gradually withdrawn into the shell, pulled in by the foot, which was retracted first.

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COLLECTING LINGULA IN THE FIJI ISLANDS.

by E. N. GARDNER.

ONE of the most interesting shells collected on a recent trip was a species of the primitive brachiopod, Lingula. It has two slightly inequivalve, somewhat rectangular shaped greenish-brown valves, gaping a little at the extremities. Passing out between the umbones is a long creamy coloured pedicle, which the Fijians love to eat.

In order to catch these shells, one requires plenty of experience. The collector creeps along the mudflat, not far from the shore, peering ahead to spot three holes, slightly apart and about 1-8th inch in diameter. Quickly the hand goes down, fingers and thumb are pushed into the mud on either side of the holes, and if the collector has been quick enough, he will find he has hold of the shell of *Lingula.* The valves are fragile, so that the temptation to pinch them hard while the other hand digs frantically round the shell, must be resisted. Lingula, at the slightest suspicion of anything approaching, burrows down by means of the muscular pedicle, and in a few seconds it well down out of reach.

A deep hole was dug in one spot where it was known that a Lingula had been a few moments before, but the shell had vanished. Lingula is quite common at Suva, where a Fijian might collect several hundred for supper. The pedicle breaks very easily; in fact, in some cases it seemed to be dropped by the animal after being put into the collecting bag. It was about 6 to 8ins. in length, in a large specimen.

The Fijian girl who showed me how and where to find Lingula, had a novel method of catching it. Having caught hold of the shell, she slowly twisted it back and forth, whistling softly, and pulled the specimen up complete. I tried too, but must have been out of tune, as it was very seldom that one came up without part of the pedicle missing.

NEOTHAIS SMITHI (BRAZIER) 1899

AND SOME FURTHER NOTES.

by E. RICHARDSON.

In Bulletin No. 7, Mr. R. L. Matthews records the finding at Brampton's Reef, of the rare Neothais smithi, associated with the common species Neothais (Dicathais) scalaris, which in its juvenile form, at first glance appears not unlike N. smithi.

Since then the writer has collected two specimens, both associated with N. scalaris young. The small size, squat build, coarse spiral thickenings, and the characteristic apertural processes, are features which make this shell so quickly recognisable.

Known records:

Kapo Wairua, Spirits Bay. Coll. R. K. Dell, 12/39, 1 sp.
Stacks, Whangaroa. Coll. A. W. B. Powell. 1 live sp.
Brampton's Reef, Bay of Islands. Coll. R. L. Matthews. 1 live, 1 dead.
Cooper's Beach, Manganui. E. Richardson, 16/10/49. 1 live sp.
Fishing Lodge Reef, Whangaroa, E. Richardson, 3/50. 1 live sp.
Bay of Islands (J. C. Anderson, of Suter). Number unknown.

Pteronotus eos:

It appears that the yellow form of this shell has an area of distribution limited to the vicinity of Whangaroa. Two further recent finds are yellow, while one a little further south is pink. A pink shell from Taupo Bay a little north of Whangaroa, has already been noted.

It is of interest to note that a visit to the outer Shag Point area resulted in the finding of a further 21 live yellow eos in a few minutes.

Tauranga Bay. 1 live yellow coll. I. Worthy, Feb. 1952.
Whangaroa Heads. 1 live yellow coll. N. Gibbons. 22/2/52.
Mahinepoa Pen. 1 pink coll. E. Richardson. February, 1951.
Outer Shag Point area. 21 live yellow coll. E. Richardson.

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PRONUNCIATION OF LATIN NAMES

by J. E. ROSENBAUM.

The English language is a living language and thus is able to increase its vocabulary by creating new words and by assimilating foreign words. The letters of such foreign words are sooner or later pronounced like English ones. The fact that the same letter may have different values in different languages is overlooked or deliberately neglected. This process may be objected to by the purist, but it is unavoidable.

It must be different where the pronunciation of scientific, botanical or zoological names is concerned. These terms are part of an international language, and must be pronounced according to the rules of that language, which would otherwise lose its purpose. The majority of us may never have an opportunity to discuss matters zoological or botanical with people of other countries, but it is only right and proper to stick to the rules.

The following are the rules for the pronunciation of the letters and the stressing of syllables in Latin and latinized names.

It is easy for a New Zealander to remember the proper values of the vowels; they are the same as in the transcription of Maori names.

a is short or long as in Wăngānui.
e is short as in Waihĕkĕ, or long as in Rēwarēwa.
i is short or long as in pĭpī.
o is long or short as in Rarōtŏnga.
u is short as in bŭtcher, or long as in Yūle.
y is pronounced i.
eu is pronounced as oi (in the Lambeth Walk).
au is pronounced as in Tauranga.
j is pronounced as y in yacht.
th is pronounced t.
ph is pronounced f (except where the Greek prefix ep is attached to a noun beginning with an h): ep-hippium.
ch may be pronounced as k (the exact equivalent of the sound does not exist in English or Maori).

Vowels are long in open syllables, *i.e.*, in those that end with a vowel. Thus we have cŏst-ā-tŭs, with a short o, long a, and short u.

Where terms are made up of personal or geographical names, they are pronounced according to the rules of the language of origin, except for the latininzing suffixes: Iredalei, Poirieria (pō-ā-rī-ē-rīă), Foveauxiana (fō-vō-ī-ā-nă).

The rules of stress are more complicated and narrowed by exceptions. *(a.)* Normally the stress lies on the important part of the word, not on a suffix or prefix (unless this is particularly important for the meaning). In compound words there may be more than one stress: ótocóncha, cháropídae, páratróphon, quádricínctus, etc.

(b.) In words of more than two syllables the stress lies on the last but two (except in compound words: see above), even if this syllable does not carry the sense of the word: biccínulum, but búccinum. This rule applies to those words the last but one and the last syllables of which have vowels of little sound value: paúperis, or where all syllables are closed and the vowels therefore short: morténsenis. Where all vowels are long, or a short vowel among them is comparatively sonorous, all syllables carry nearly the same stress: caúdátus, caúdátínus, plébéjus, túrbátor, cómínélla, etc.

(c.) In contrast to the English usage, unstressed syllables at the end of a word are carefully pronounced.

RECENT PAPERS

The following recent papers on the Molluscan fauna have come to our notice, and we list them here for your perusal.

DELL, R. K.:

Otoconcha and its allies in New Zealand.
Dominion Mus. Rec. in Zoo. No. 7.

New Species and Genera of New Zealand Land Snails, with a Revision of the Genus Cavellia.
Dominion Rec. Mus. Rec. in Zoo. No. 9.

A Deep Water Molluscan Fauna of the Tasman Sea.
Dominion Mus. Rec. in Zoo. No. 10.

A Deep Water Molluscan Fauna from Banks Peninsula.
Rec. Cant. Mus. Vol. VI, No. 1, 1951.

Some Animal Communities of the Sea Bottom from Queen Charlotte Sound, New Zealand.

A Molluscan Fauna from the Mernoo Bank, New Zealand.
N.Z. Journ. Sc. & Tech. Sec. B. Vol. 33, No. 1, July, 1951.

New Marine Mollusca from the Cook Strait Area and Southern New Zealand.
Trans. Roy. Soc. N.Z. Vol. 79, parts 3 & 4, 1951.

FLEMING, DR. C. A.:

New Zealand Recent Thyasiridae (Mollusca).
Trans. Roy. Soc. N.Z. Vol. 79, Part I, 1951.

Some Australasian Mollusca in the British Museum (Natural History).
Trans. Roy. Soc. N.Z. Vol. 78, Parts 2 & 3, 1950.

MORTON, J. E.:

Structure and Adaptations of the New Zealand Vermatidae.
Trans. Roy. Soc. N.Z. Vol. 79, Part I, 1951.

POWELL, A. W. B.:

Land Mollusca from four islands of the Three Kings Group, with descriptions of Three New Species.

Further Colonies of Placostylus Snails from Northernmost New Zealand.
Rec. Auck. Mus. Vol. 4, No. 2, 1951.

OBITUARY

We greatly regret to have to record the death of one of our members this year: Mr. J. B. Penk, of Auckland, who was an enthusiastic collector.

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CONCHOLOGY SECTION
OF THE
AUCKLAND MUSEUM

BULLETIN No. 9

AUCKLAND, NEW ZEALAND

DECEMBER, 1953

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CONCHOLOGY SECTION OF THE AUCKLAND MUSEUM
BULLETIN No. 9

EDITORIAL

The year, 1953, has proved an important one for the club.

We have been honoured by the invitation of the Museum Council to become a Section of the Institute and Museum, and this fittingly comes at a noteworthy time. It is 21 years since the Club was founded by Mr. Powell—originally for boys, and during this time continuous enthusiasm has been maintained. Collectors have joined from all parts of the country until we now have over 100 members.

Considerable progress has been made in our main project, a Survey of the Molluscan Fauna of the Manukau Harbour and well attended field days have brought to light some interesting shells.

We are fortunate to have obtained for this year's publication Mr. Powell's "Additions to the Recent Molluscan Fauna of N.Z." Collectors should find this list of great assistance in their studies.

E. N. & N. W. GARDNER, *co-Editors.*
1st December, 1953.

* * *

DISTIBUTIONAL NOTES

ON SOME OF OUR SMALL TERRESTRIAL MOLLUSCA

by A. E. BROOKES.

I have chosen this subject as I have had a wide experience and many opportunities of collecting in localities not easily accessible.

Nearly all the species herein mentioned were obtained from fallen leaves gathered from the ground. From 1916 to 1918 I was located at Lake Ohia, some 12 miles north of Mangonui. This was before any permanent road around the rocky headland between Cable Bay and Taipa existed, and during the Spring tides it was impossible to get along the beach with a buggy or cart when the tide was in, but a track existed over the bluff which the writer on horse-back had to use on several occasions. At this time there was very little settlement except at Taipa where a large area of the original bush had been cleared, and the fine Kauri logs brought down to the Auckland mills by scows. A few miles further inland from Lake Ohia there was still some fine bush, and also at Kaingaroa, some five miles further on towards Awanui. It was in both these remaining areas of bush that I first found the two species, *Murdochia arenea* and *Phrixgnathus larochei,* and which some years later were obtained by the late Mr. W. La Roche in the Hokianga district and described by Mr. Powell. On my visit to the far north in November, 1951, I found the two above areas of bush practically all burnt off and the land being farmed. Many of our small land species that are restricted to narrow limits appear to be doomed to extinction in the not very distant future.

Allodiscus tessellatus Powell.—This appears to be a very local species and so far only recorded from the type locality. It was found quite by accident by the writer in a rather isolated patch of bush in the Whakatane River Valley, above the road, some miles south-east of Ruatoki, Bay of Plenty district, at an altitude of about 800 feet. It was found living under stones in a trickling stream evidently from a near-by spring near the top of the ridge. Strangely enough, associated with this species, also under stones where there was a little more water, were a few specimens of the uncommon freshwater species *Potamopyrgus egenus* (Gould), a rather puzzling situation for it, and worth recording.

Flammulina olivacea (Suter).—This is undoubtedly a very rare and elusive species. Suter cites (p. 679) Hillyers Creek, Auckland, as the type locality. Although I have had a number of samples of leafmould from there and adjacent areas I have never seen it in the material examined. I have, however, collected it on the Kaimai Range, at an altitude of 1,520 feet, off the main highway between Matamata and Tauranga, but only four specimens from many examinations of material over a period of 25 years. So far as I am aware this species has not been recorded from any intermediate localities.

Flammulina feredayi (Suter).—This small interesting species, although it has a wide range is certainly not a common shell, and like many other small species is found amongst decaying leaves on the ground. Besides the localities cited by Suter, the writer has taken it near the mouth of the Motu River, in the Bay of Plenty and the Kaimai Range.

Flammulina cornea (Hutton).—This is another scarce member of this group. Suter cites " Auckland " as the type locality. This is of course very vague, and not much help to any collector searching for it. The only specimens in my collection were found by myself at Port Fitzroy, Great Barrier Island.

Ptychodon wairarapa (Suter).—This species is recorded from the southern parts of the North Island, and the northern parts of the South Island. The writer has also taken it at Hongi's Track, in the Rotorua district.

Phenacharopa novoseelandica (Pfeiffer).—This species is fairly well distributed on the east coast and southern portions of the North Island, and some northern localities of the South Island. The writer has taken it on the Hen Island, off Whangarei Heads, and specimens are also in my collection from the Whangarei mainland district.

Egestula transenna (Suter).—This is another elusive species. The only record given by Suter is the type locality, Waitakere Range, near Henderson (Auckland). During a visit to Stewart Island a few years ago I found a single typical specimen amongst dead leaves, which was a great surprise, and clearly illustrates our poor knowledge of the distribution of many other small forms of some of our land mollusca. An intermediate form, rather darker in colour, and larger, is to be found in the Hooker Valley, in the Mt. Cook district of the Southern Alps. It is difficult to understand how Suter missed recognising this shell, as he must have collected it during his stay over many months, at the " Hermitage."

Laoma elegans Suter.—This is a species that the writer has been very keen to obtain for many years past, but so far without success. I have investigated numerous samples from the forest floor, covering many localities in the Whangarei district, which Suter cites as the type locality, and I am beginning to think it is incorrect. However I have not given up eventually locating it.

SEVENTEEN WEEKS

IN THE LIFE OF AN ARCA NOVAEZELANDIAE SMITH

By G. WILLIAMS.

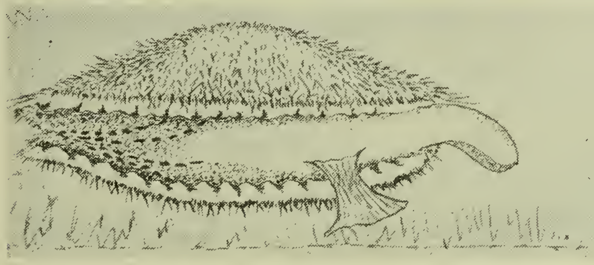
THE writer discovered a live specimen of *Arca novaezelandiae* below low tide mark on the under side of a rock situated on the reef at the Harbour Beacon, Pilot Bay Mt. Maunganui, May 5th, 1947.

Sheltered as it was from rough seas and only subject to the movement of the tides the shell retained its covering of long hair to such an extent that at first sight it was not recognised for what it was. The animal was so firmly attached to the rock that a knife had to be used to detach the byssus without injuring it.

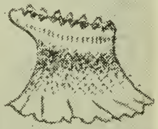
Taken home the animal was placed in a pyrex dish about four inches deep by ten inches by eight inches containing sea water, a few stones growing seaweed and anemones were added to make the environment more natural; a *Cominella adspersa* acted as house cleaner and the water was changed every day. The animal lived and was studied until September 5th (123 days).

Although single valves of *Arca novaezelandiae* have been found on the ocean beach measuring up to 80 m.m in length this shell was of average size; length 58 m.m., height 30 m.m. diameter 20 m.m., and was covered excepting the beaks with an epidermis consisting of long dense reddish brown hair.

The animal showed very little sign of life for the first two days, but on the third morning it was found firmly attached to the side of the glass dish just below the surface of the water. A new byssus had been formed and the original sheath lay cast on the bottom of the dish.



Showing the shell partly open, exposing the fish attached to the glass by its byssus.



A cast byssus sheath.

This sheath consisted of a tough horny substance, dark green in colour with a satiny sheen and measured: height 13 m.m., width 18 m.m., diameter 2 m.m. The top or body end was denticulate, the lower end being ragged and irregular.

A few days later the animal again changed its position, leaving the discarded sheath so firmly stuck to the glass that it required a knife to remove it; once more it fixed itself just below the surface of the water in a new position. This discarding of sheaths and forming of new byssi continued until August 9th; after that no attempt was made to form a new byssus and the animal lived a free life on the bottom of the dish amongst the stones which were never used as a hold, and finally died on September 5th.

Altogether 12 byssi were formed and cast, gradually decreasing in size till the last which measured 4.4 m.m.

As the animal was nocturnal and very shy it was never seen on the move so a description of how it was able to climb the glass sides and affix itself well above the bottom of the dish is impossible.

The sketch of the animal showing the byssus attached to the glass was made 39 days after being in captivity and was the 8th byssus, a flash lamp was used and much patience required as the least movement caused the animal to close with a snap.

*

DEEP WATER MOLLUSCS FROM TIMARU AREA

by S. TRIGANCE

FIRSTLY I would like to pay tribute to the trawler-men of Timaru. It is entirely through their assistance that I have been able to obtain deep water specimens from this area and to learn something of the particular localities they inhabit.

Most trawling operations are done in depths varying from 15 to 70 fathoms, and the bottom encountered is mainly from sandy to muddy because of so many rivers emptying into the area between Rakaia and Waitaki.

The winter season has always been the one to show best results. I might add that the same is true of shore and reef collecting as far as I am concerned. Another feature is that the best trawled specimens are obtained in depths ranging from 40 to 70 fathoms. An explanation for this fact could be that not many of the fishing fleet are equipped for depths of over 40 fathoms, hence the bottom is not disturbed to anywhere the same degree as it is in the 15 to 30 fathoms zone. Nearly all my most prized rarities have been taken in the deeper water: the men out there seem to take a much keener interest in trying to bring something new to light for me than to obtain quantities of the more common species. Over a period of three years I have managed to collect 50 verified trawled specimens from the Timaru area, which I list hereunder:

Brachiopoda

Magasella sanguinea (Leach), 30 fms. S.E. Timaru, 1950.
Waltonia inconspicua (Sowerby), 15 to 20 fms, S.E., 1951.
Neothyris lenticularis (Desh), 40 to 60 fms, S. E., 1952

Mollusca

Notovola novaezelandiae (Reeve), 20 fms., S.E., August, 1953.
Chlamys celator Finlay, 20 fms., S.E., August, 1953.
Chlamys radiata (Hutton), 40 to 50 fms., N.E., 1951.
Lima zelandica Sowerby, 60 to 70 fms., S.E., 1952.
Ostrea charlottae Finlay, 20 fms., N.E., 1952.
Atrina zelandica (Gray), 15 to 20 fms., N.E., 1951.
Cardita aoteana Finlay, 50 fms., E., 1952.
Divaricella cumingi (Ad. & Ang.), 50 fms., E., 1952 (Dead).
Taras globus Finlay, 35 fms., N.E., 1952.
Longimactra elongata (Q & G), 40 to 50 fms., S.E., 1953.
Notocallista multistriata (Sowerby), 40 fms., E., 1952.
Bassina yatei (Gray), 15 to 20 fms., N.E., 1952
Gari lineolata (Gray), 15 to 20 fms., E., 1953 (Dead).
Panope zelandica (Q & G), 3 0to 40 fms., N.E., 1952.
Myadora striata (Q & G), 20 fms., E., 1952.
Monodilepas otagoensis Finlay, 60 fms., E., 1952.
Tugali colvillensis Finlay, 60 fms., E., 1952.
Venustas pellucida forsteriana Dell, 15 to 20 fms., S.E., 1951.

Venustas cunninghami (Griffiths & Pidgeon), 20 fms., E., 1950.
Venustas cunninghami pagoda (Oliver), 15 to 20 fms., E., 1950.
Venustas miltigemmata Powell, 20 fms., N.E., 1950.
Modelia granosa (Martyn), 30 fms., E., 1953 (Dead).
Astraea heliotropium (Martyn), 70 fms., S.E., 1951.
Cookia sulcata (Martyn), 15 to 20 fms., S.E., 1951 (Dead).
Maoricolpus roseus (Q & G), 15 to 20 fms., E., 1950 (Dead).
Struthiolaria papulosa (Martyn), 15 to 20 fms., N.E., 1950.
Struthiolaria vermis (Martyn), 15 to 20 fms., S.E., 1952 (Dead).
Tanea zelandica (Q & G), 15 to 20 fms., E., 1950.
Friginatica n. sp., 60 fms., S. E. (Dead).
Globisinum wollastoni Finlay, 70 fms., E., 1950, 1 sp. (Dead).
Charonia capax Finlay, 60 fms., E., 1953.
Argobuccinum tumidum (Dunker), 30 to 40 fms., S.E., 1951.
Fusitriton laudandum Finlay, 70 fms., E., 1952.
Xenophalium hamiltoni Powell, 50 fms., S.E., 1952.
Galeodea n. sp., 60 to 70 fms., N.E., 1951.
Verconella ormesi Powell, 60 fms., E., 1952.
Verconella fairfieldae Powell, 60 fms., E., 1952.
Aenator otagoensis Finlay, 50 fms., S.E., 1952.
Austrofusus glans (Bolten), 60 fms., E., 1953.
Coluzea mariae Powell, 70 fms., E., 1952, 1 sp. (Dead).
Poirieria zelandica (Q & G), 20 fms., N.E., 1952 (Very tiny).
Glaphyrina vulpicolor (Sowerby), 60 fms., E., 1953 (70 x 30 m.m.).
Zeatrophon ambiguus (Philippi), 50 fms., S.E. (Dead).
Alcithoe (Leporemax) fusus (Q & G), 50 fms., N.E., 1953.
Alcithoe swainsoni Marwick, 40 fms., N.E., 1952.
Baryspira mucronata (Sowerby), 20 fms., S.E., 1950 (Dead).
Fissidentalium zelandicum (Sowerby), 50 fms., S.E., 1953 (100 m.m.).

—★—

STEWART ISLAND MOLLUSCA

ADDITIONS AND CORRECTIONS TO MY 1952 LIST.

by E. K. A. SMITH.

NOTE: The symbols used are those of the previous paper.

The following items should be deleted: Nos. 118, 482 and 837; and *Zelaxitas* sp.n.? Bathing beach, *Eucominia* sp.n.?, *Antiguraleus* sp., and Rock Oyster. The *Eucominia,* Mr. Powell considers to be a freak form of *nassoides,* though it is fairly constant. The Rock Oyster is the littoral form of *Ostrea sinuata* (Lamarck). The species is also found on muddy bottom in shallow water at Port Adventure.

ADDITIONS

159 *Taras (Zemysina) striatula* Finlay, F.G. 2.
★399 *Venustas foveauxana* Dell. This should replace Powell's record of *Maurea spectabilis.*
430 *Liotella rotula* (Suter) *(Munditia* sp. of 1952 List). F.G. 5, 60 fms.; F.G. 1, 40 fms.
614 *Scalaronoba costata* Powell, F.G. 4-5.
712 *Dardanula chiltoni* (Suter). *(Zelaxitas* sp.n.? Bathing Beach of 1952 list). S. 4, l.m.w.
723 *Brookesina succincta* (Suter). Codfish Island, s.s.
★ *Ruapukea carolus* Dell. Off Ruapuke Island, 13 fms. Holotype in Geological Survey Department.

793 *Notosinister fascelinus* (Suter). Confirmed.
Uberella denticulifera (Marwick). *Proxiuber australis* of 1952 list) F.O.B. 9th June, 1952.
1102 *Austrofusus chathamensis* Finlay. Mason Bay, b.d.
Macrozafra cophinoides (Suter). (Sutman, p. 496). F.G. 4.
1386 Cylichnina cf. opima Finlay. F.G.5. In fine s.w. on sandy bottom.
Philine aff. *auriformis* Suter. F.G. 4 in cod's stomachs: S. 4, b.d.; Codfish Island, coll. R. K. Dell.
★1796 *Diaphoroplax biramosa* (Q & G). Codfish Island, coll. R. K. Dell. Spec. in Dom. Mus.
★1826 Spirula spirula Linnaeus. Mason's Bay. Coll. O. Allan. Spec in Dom. Mus.

ERRATA IN 1952 PAPER.

Page 6, line 1. For G.G. read F.G.
Page 7, line 23. For *fosteriana* read *forsterianum.*

ACKNOWLEDGEMENTS

I must again thank Mr. Powell and Mr. Dell for help and the use of material; and the former for correcting some of my determinations.

*

COLLECTIONS OF MOLLUSCA

IN THE NEW ZEALAND GEOLOGICAL SURVEY

by C. A. FLEMING.

PALEONTOLOGISTS of the Geological Survey have the job of determining the geological age of fossils collected during surveys by field geologists. For this purpose they maintain reference collections of New Zealand fossils, of their living representatives, and of living shells and fossils from other parts of the world that are needed for comparison in systematic studies. In addition to mollusca, the Survey has collections of foraminifera,, ostracoda, polyzoa, corals, echinoids, brachiopods, crabs, barnacles, fish remains (teeth, otoliths, etc.) and a few other vertebrates (penguin, seal, reptile and whale bones), and of fossil plants (leaf impressions, seeds, spores and pollen grains, diatoms). Two paleontologists work on the mollusca that are the commonest fossils apart from micro-organisms and in spite of cramped accommodation the collections are available for consultation by conchologists. The paleontology section thus constitutes a research museum in which the country's collections of fossils are maintained for the service of the geologists and for use by research workers.

The collections of interest to New Zealand conchologists are listed below.

1. Recent Mollusca Collection.

This collection representative of shell-bearing marine mollusca was built up (mostly by Dr. J. Marwick) from many sources by exchange, gift, and field work. It includes the Fleming Collection, the New Golden Hind Collection from Fiordland, substantial collections from the Auckland Islands (Cape Expedition 1942), and types of some recent species described by Marwick, Fleming, and Dell. The collection contains 2,400 registered " lots," each one being one or more specimens of a species from one collecting station.

2. Suter Collection of N.Z. Recent Mollusca.

The collection of Henry Suter, acquired by Wanganui Public Museum after his death in 1918, was purchased by the Geological Survey in 1946. The land and fresh water mollusca have been deposited in the Dominion Museum, Wellington. The collections, the basis for Suter's "Manual of New Zealand Mollusca" (1913), include many specimens figured in the Atlas and more than 200 types. For these historical reasons Suter's N.Z. collection at the Geological Survey has been kept separate from other collections.

3. *World Mollusca Collection.*

The nucleus of this collection was obtained by exchange during Sir James Hector's directorship of the "Old" Geological Survey (1865-1903) and has subsequently been built up by exchanges undertaken by Dr. J. Marwick. The objects of the collection are to provide type species of genera for use in systematic work on New Zealand fossils and a range of species related to those of New Zealand for general systematic comparison, but it is not limited by these objects and includes a comprehensive representation of world mollusca. For convenience, fossil and recent species form a single collection. Like most large collections, it includes some ill-located and unidentified material as well as specimens with full data. In 1946 it was supplemented by the Suter world marine mollusca, comprising about 1.700 registered items and including useful "co-types" of Australian species described by Hedley, May, Verco. and others. The whole collection is estimated to contain about 10,000 "lots," but only 900 so far have been registered.

4. *New Zealand Tertiary Mollusca.*

The types, housed in separate cabinets, number several hundred. The first New Zealand Tertiary mollusca described (by Zittel from Hochstetter's collections made in 1859) are represented by plaster casts recently supplied by the Vienna Natural History Museum. Many of the types of species described in Hutton's "Catalogue of Tertiary Mollusca" (1873) survive (some are still housed in the Dominion Museum). Most of the types are species named by Geological Survey paleontologists—Suter (1914-17), Marwick (from 1924), and Fleming (from 1943); but others were named by Marshall, Murdoch, Waghorn, King, Powell, and Vella.

The reference collection (containing thousands of specimens representing most known Tertiary species) is used almost daily in the task of listing and reporting on fossils sent in by geologists.

5. *Collection of Mesozoic Mollusca.*

The Cretaceous collections include the types of species described in Paleontological Bulletin 4 by the veteran English paleontologist, Henry Woods, and many from Wangaloa described by Finlay and Marwick (Pal. Bull. 15), together with odd species described by Suter, Marwick, Trueman and Marshall. Perhaps the most important single New Zealand fossil is the type of *Maccoyella magnata* ("born to be great"), a unique, battered specimen that enabled Marwick to prove the age of an extensive group of rocks in the Gisborne district. The Survey's original collection of *Inoceramus* was loaned to a specialist in Leipzig where it remains at present "behind the Iron Curtain."

Jurassic and Triassic mollusca are represented by large collections, many of them first obtained by Alexander McKay, the "Grand Old Man" of New Zealand geology. They have been named by Sir James Hector (1878, 1886), founder of the New Zealand Geological Survey; by C. T. Trechmann (1918, 1923); by Otto Wilckens (1927); and by J. Marwick (1926, 1935, 1953).

The most characteristic Mesozoic fossils, Nautilus-like Cephalopods knows as Ammonites, are represented in the Geological Survey by part of the Cretaceous collection reported on by Marshall (1926); by the collection of the late R. A. S. Browne, who described the oldest New Zealand ammonites (1951); and by other specimens of varied origin. The largest New Zealand ammonite, 2ft. in diameter and over 1cwt. in weight, was collected by Mr. M. Ongley near Porongahau in 1929. It is probably the largest New Zealand mollousc ever collected.

6. *Collections of Paleozoic Mollusca.*

New Zealand Paleozoic rocks have been altered by pressure during deep burial so that their fossils are seldom well-preserved. Permian molluscs are represented by several Pelecypods (of which the most widespread is *Maitaia trechmanni* Marwick) and by the ancient gastropod *Pleurotomaria.* The oldest New Zealand fossil molluscs are several pelecypods and a Capulus-like gastropod from the Devonian of Reefton and Baton River.

[E. J. THORNLEY, *photo.*
Giant Cretaceous Ammonite from Porangahau, perhaps the largest New Zealand shell ever collected.

—★—

TRAWLING SHELLS IN THE BAY OF PLENTY

by A. S. VOSS.

For the trawling of specimens, the Bay of Plenty affords a considerable area: the best, I believe, in New Zealand.

Leaving Tauranga Port one can trawl as far as East Cape to the east, and Mayor Island and beyond to the north.

In my experience it is only in certain areas that specimens can be trawled—one gradually gets to know the good spots—and the time of the year seems to have some bearing on results. Up to this year my trawled shells have never been below 60 fathoms, but this year I have had material from as far down as 100 to 120 fathoms. This depth is not guesswork, as aboard the trawler there is an echo-sounding instrument which not only indicates the correct depth but gives a graph of the type of sea-bed it passes over. It records like a thermometer chart. A straight line would indicate a sandy level bed, while a wavy one would point to the bottom being rocky and uneven I have mentioned this as I am sure many people imagine that in trawling, one has only to put the gear overboard and up comes all the shells one wants. Early in my trips I would sometimes be out several days and return with less than a dozen specimens and on one occasion in 1950, after being at sea for five days my entire " bag " was five Verconella and poor ones at that.

One of the best areas is in the vicinity of Whale Island, a trawl towards White Island down to 60 fathoms, or towards Plate Island at about 45 fathoms. Near Whale Island good specimens of *Verconella adusta, V. mandarinoides and V. dilatata* come up, and also the subspecies, *V.d. elongata, V.d. rotunda,* and *V.d. cuvierana.* From this area I have had good large specimens of *Alcithoe jaculoides* and *A. swainsoni. Alcithoe johnstoni* I have been able to get in deeper water. In the stretch between Cape Runaway and White Island I have had good specimens of *Verconella* and a number of that rare shell *Ranella multinodosa.* It is also in this area that I get the small *Alcithoe fusus.* Another point of interest is that in deep water near White Island *Verconella* is usually large, clean and thinly shelled. I think that the sulphur from White Island may have something to do with it.

The 100 to 120 fathoms area northwest of Motiti Island has of late been yielding some excellent material. This was the station which recently brought to light six specimens of *Alcithoe larochei. Alcithoe jaculoides* from here are particularly large, but a fair proportion are dead shells covered with Capulus and other limpet-like species, one of which I hope will prove to be new. My best specimen of *Alcithoe johnstoni* was dredged in this area—a perfect example. Nearer to Motiti Island in water between 30 to 35 fathoms, I have had some wonderful specimens of *Xenophora,* but it is hard to get a perfect one as the attached shells break off so easily. I have in my collection two perfect specimens from here.

I have also had a number of *Charonia* and this I find one of the hardest from which to remove the animal.

Large specimens of *Tonna haurakiensis* can be obtained three or four miles off Mayor Island. It was from here I secured the new subspecies *Mayena australasia vossi.* I have also taken specimens of *Aeneator marshalli, A. otagoensis,* and *A. compta,* along with *Murexsul. Poirieria, Paratrophon, Monoplex, Alcithoe,* and at times the rare *Ranella.* I now have quite a formidable array of shells both large and small, trawled from numerous stations in the Bay of Plenty.

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SOME OBSERVATIONS ON THE FIJIAN SNAIL
PLACOSTYLUS (CALLISTOCHARIS) GRACILIS (BROD.)

by E. N. & N. W. GARDNER.

ALTHOUGH numerous species of these snails have been described from Fiji, the ecological and distributional side has been badly neglected. Garrett, who did a great deal of valuable work in this area, often failed to give exact localities, citing instead, one of the major islands as being the range of this or that species. In the case of Viti Levu, this is indeed vague, for this island is of some 4,000 square miles and has a well disected topography. The high mountain ranges are separated by large rivers and alluvial plains, while to the north there exists a low rainfall zone of grassland. These features naturally suggest that species of these snails would be restricted to certain areas instead of having a general distribution over the whole island.

During a recent trip—March, 1952—we were able to collect examples and to make observations on one particularly interesting arboreal species, *Placostylus gracilis* (Brod.), an olive green shell about 30 m.m. As a result of this investigation we found that this species at least ranges over an area bounded by the Rewa River, east of Suva, and the Navua River, to the west, a distance of 30 odd miles. It occurs directly inland as far as Sawani which is on the south bank of the Waimanu, a sizeable lateral tributary of the Rewa. We were not able to search the jungle on the north side to determine if the snail ranges still further into the interior. (Five other species have been described from this island).

Examples were collected from the following localities:

Joski's Thumb. Damaged shells only. A few nests of eggs were seen. March 19th, 1952.

Mt. Korombomba. Not common. March 23rd, 1952.

Suva Cemetery. Not uncommon. Eggs, junveniles and adults. March 23rd, 1952.

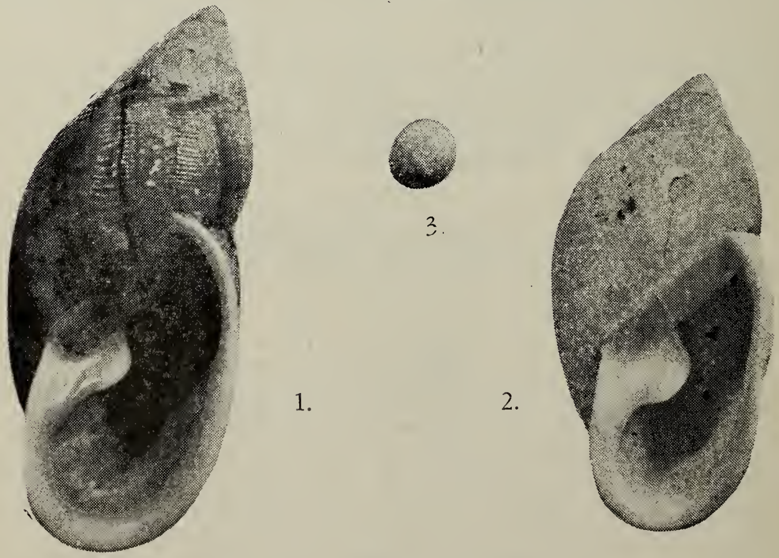
Walu Bay. Numerous dead shells. March 21st, 1952.

Sawani. Very scarce. March 21st, 1952.

There exists in the Suva Museum a few specimens from Lami Quarry and Joski's Thumb.

Nowhere does this species seem to be common. The only locality where we found it in any number was the Suva Cemetery where there is very little bush remaining. The fact that only freshly dead shells could be found at Walu Bay might be explained by the devastation caused six weeks previously by the hurricane which stripped the tops of the trees and swept away the lianas, particularly in this area.

In the Suva area the snails were living on the large stinging nettle trees known locally as Saluka. Here they were to be found on the tree trunks five to 15 feet above the ground, sheltering under the leaves of climbing plants or in knot holes and cracks. Because of their colour they were very hard to see and closely resembled the greenish buds of a lily-like climber.



PLACOSTYLUS GRACILIS (BROD.) x 2

1. Example from 800ft. on Mt. Korombomba. 2. The squat form which occurs in coastal areas: specimen from Suva Cemetery. 3. The egg of this species.

There is a confusing amount of variation in shell shape not only in isolated colonies but from district to district. As recorded by Garrett coastal specimens are very often squat in form. Shells from this zone we found to have rather course lirae, but inland, especially on the slopes of Mt. Korombomba, the sculpture was finer, the shell longer, while the colour also varied from normal pale olive green to brown.

Considerable numbers of eggs were found. These had been deposited in the soil and leaf mould that collected in the "pockets" of the buttress roots of the Saluka trees. A few only were seen on the jungle floor. The eggs were laid in nests of up to eighteen, were nearly round (4 m.m. diameter) and whitish in colour. There does not appear to be a tough cuticle as is the case with many Solomon Island species.

Quite a number of shells were found minus the upper whorls. Whether this is the work of some of its natural enemies or of introduced vermin is a point open to debate. Some local people are convinced that the introduced toad has taken toll of the snail population, but this seems unlikely as many of the *Placostylus* are arboreal and so would be well out of the way. Mongooses may get a few but on Ovalau Island where the mongoose is absent, decollated shells were seen. From all the evidence available it appears that the common rat is responsible for most of the damage.

Strangely enough the ground snail, *Irenella nouleti* Le Guillou, which can be seen actively crawling about in numbers after rain, does not appear to have interested these marauders to any marked degree.

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THE MAKING OF SPECIMEN CABINETS

by A. H. JONES.

MOST collectors keep their small and medium size shells in trays and cabinets. The general opinion among collectors is that cabinets with runners are unsatisfactory, as shallow trays cannot be changed for deeper ones when required.

Taking down half a dozen trays to get at number seven appeared to be a cumbersome method, so to overcome this difficulty the writer built a cabinet with removable steel runners, and when it is found necessary to use a deeper tray, one set of runners are removed and a 3 inch tray can then be used in place of two 1½ inch, or a 4 inch in place of two 2 inch.

I give hereunder dimensions and method of construction, together with plan and elevation in the hope that they may be of use to other collectors.

The finished cabinet is 27in. high including casters, 37¾in. wide, and 18⅝in. deep, this is for a two tier cabinet and holds 12 trays 1½in. deep and 14 trays 2in. deep, 26 trays in all. Height can be increased to suit individual requirements. 27in. high is an advantage as the top can then be used for display purposes, while the casters allow for easy grouping when a continuous bench is required.

To construct, frame up top and bottom sections as shown on plan, 18½in. wide and 37½in. long, using the following timbers: side and end rails 2in. x ⅞in., centre rail 3in. x ⅞in. Glue joints and fix with corrugated fasteners. End and centre sections, 18in. wide and 23½in. high, using 2in. x ⅞in. timber; fix as for above. Side guides and fixing for steel runners, 1 x ½in., 48 pieces 18in. long. Runners: steel cutting rule, 1in. wide, 12in. to 18in. long. Punch holes in rule about 4in. apart and fix in pairs on top or ½in. edge of side guides, using flat head nails clenched on under side. Rule is kept flush at front end and back edge of guide (see detail on plan). Bevel off ends of rule slightly to prevent scoring of tray. Screw guides to end and centre sections to previous setting out, using 1in screws countersunk slightly under flush.

Assemble cabinet by first screwing top to end and centre section. Turn over and fix bottom in the same way.

Cover top with Pinex hard board, allowing ⅛in. over at ends and back. Cover ends as above, allowing ⅛in. over at back, using Casein glue and ¾in. brads for fixing. Facing strips, 1½in. x ½in., are fixed to front of cabinet to cover end and centre framing and ends of guides, as shown in elevation.

Trays are made of the following timbers: front ⅞in, sides ½in., bottom ⅛in., plywood, hardboard or cardboard, and are 16½in. wide, 18in. back to front and depth as set out for in cabinet.

To construct: Rebate front at both ends, ½in. x ½in., to take sides. Rebate bottom edge of front and sides, ⅛in. x ¼in. to take bottom; this allows ¼in. of timber at sides to slide on steel runners. Back is made ⅛in. less in width than sides and is housed into sides ¼in. Sides are made with ½in. overhang at back to serve as bumpers on back of cabinet. Glue joints and nail from sides with 1¼in. brads. Bottom glued and nailed with ⅜in. flat head nails, after first planing up square to fit rebate in bottom of tray. This method of construction in place of the orthodox way, gives the full depth, less thickness of bottom for specimens.

Trays on completion, should be planed up to fit all openings of the appropriate size in cabinet.

Exposed woodwork may be stained to match Pinex board, or the whole cabinet painted to suit the taste of collector.

Title holders are made from copper sheeting. Method of making was described in the August Newsletter.

* * *

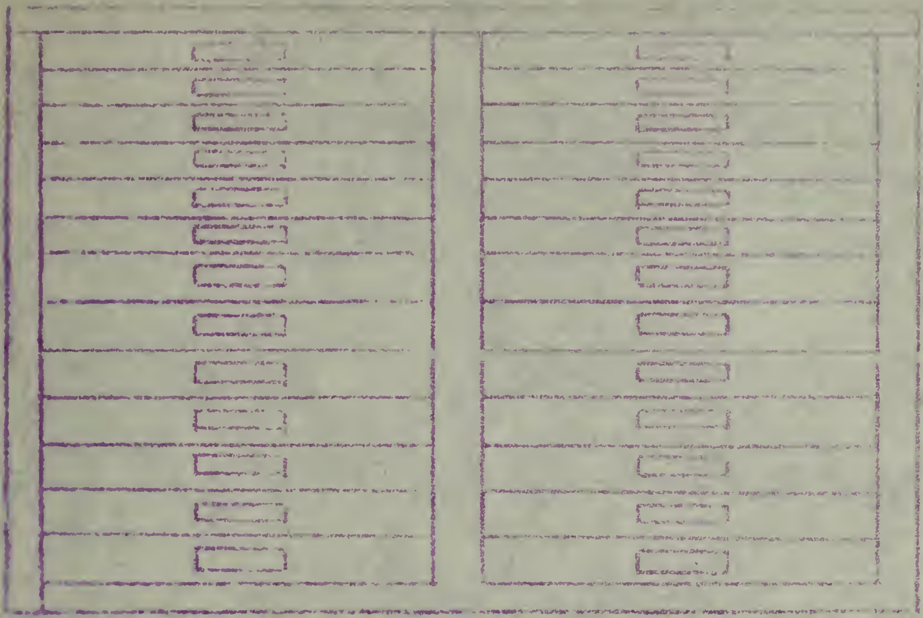
AN EXTENSION OF THE RANGE OF *PARYPHANTA WATTI* POWELL

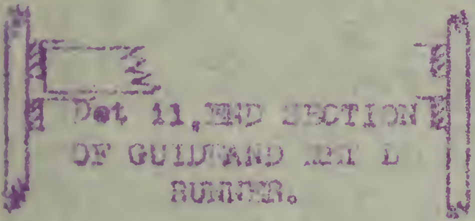
by N. W. GARDNER.

THIS snail, which is restricted to the Cape Maria—Spirit's Bay area is nowhere common. There is little remaining bush apart from the stand which covers the eastern side of Unuwhao, and it is from this locality that most specimens have been taken. A few examples have also been collected from the inland slope of the ridge at Pandora but here they are decidedly rare.

The consolidated dunes at Cape Maria have yielded occasional subfossil shells of this species, bleached with the passing of time, but nevertheless quite well preserved.

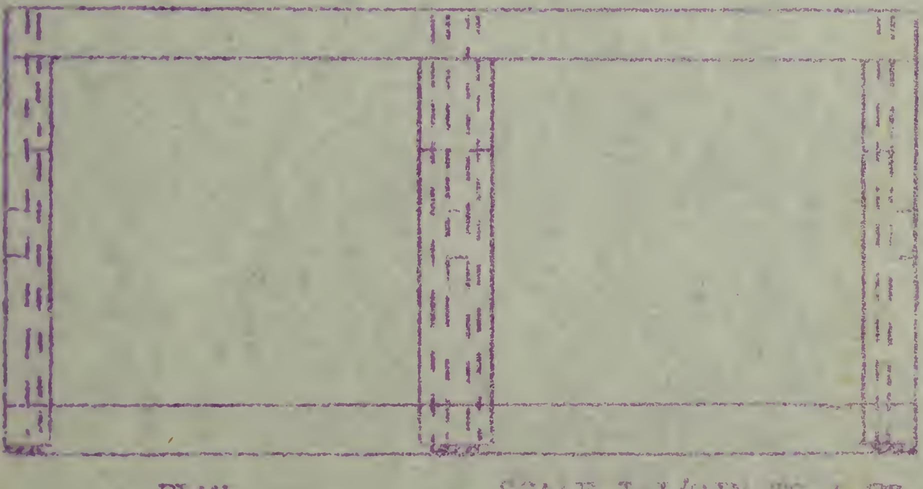
To the eastward it had not previously been recorded, but during January, 1950, I stumbled across the remains of a colony in the consolidated dunes at the eastern end of Tom Bowling Bay, a few hundred yards from the higher North Cape Block. These subrecent shells, the majority of them broken, were grouped together, suggesting that they had lived in what had been a small patch of bush. The shells showed little variation from the Cape Maria counterparts, being only a little smaller in overall size.





Det. 11, END SECTION OF GUIDEAND METAL RUNNER.

FRONT ELEVATION.



PLAN.

SCALE, 1.1/2 IN. TO 1 FT.

SHOWING TOP AND BOTTOM FRAMING.

NOTES OF INTEREST

1. *by* A. H. JONES.

An unusual occurence noted on the West Coast in the vicinity of Whatipu, was the washing out of a hole in the beach near high tide mark. It covered on area of possibly 2 chains wide by 3 chains long at the low tide..

The beach sloped steeply down from high tide mark and was covered with shells to a depth of 3 to 4 inches in places, some still containing the live animal, notably *Amphidesma subtriangulatum* on which the gulls were feeding. Large schnapper were also coming in on the high tide to join in the feast as proved on the following day, when five or six were taken in a short time.

Specimens were collected as follows:

Acar sandersonae Powell.
Musculus impactus (Hermann).
Chlamys zealandiae (Gray). Halves.
Chlamys zeelandona Hertlin. Halves.
Divaricella cumingi (Ad. & Ang.).
Angulus gaimardi (Ired.).
Amphidesma subtriangulatum (Wood).
Mactra discors Gray.
Spisula aequilateralis (Desh.).
Dosinia anus (Philippi).
Dosinia subrosea (Gray).
Tawera spissa (Desh.).
Paphirus largillierti (Phillipi).
Gari lineolata (Gray).
Trochus tiaratus (Q & G).
Venustas cunninghami (Griffiths & Pidgeon).
Venustas punctulata urbanior Fin.
Zeacolpus n. sp. cf *ahiparanus* Powell.
Xenophalium pyrum (Lmk.)
Cirsotrema zelebori (Dunker).
Alcithoe swainsoni Marwick.
Alcithoe swainsoni motutaraensis Powell.
Baryspira australis (Sby.)
Baryspira novaezelandiae (Sby.).
Baryspira mucronata (Sby.)
Baryspira depressa (Sby.)
Antimelatoma buchcanani maorum (E. A. Smith).
Neoguraleus amoenus (Smith).
Pervicacia tristis (Desh.).
Dentalium nanum Hutton.

2. On a recent trip to Mill Bay to collect for the Manukau project, an item of interest noted was the quantity of dead *Pecten novaezelandiae,* averaging about 2½ inches.

The shells were clean and had the appearance of having recently died, as some contained the dead, or portions of the dead animal. Apparently birds were not responsible, as the shells were not damaged in any way. The excessive amount of fresh water coming into the bay from the recent heavy rains, may have caused the mortality.

3. *by* S. HULME.

The rather rare Cabestana bolteniana (A. ad.) has been found near Taumatarea Pt. Laingholm. It was found on November 8th, 1952 under the same conditions as the more common species Cabestana spengleri (Perry).

On a low tidal boulder at Puponga Pt., one specimen was found on October 3rd, 1953. There was no mud in the immediate vicinity of this locality.

ADDITIONS TO THE RECENT MOLLUSCAN FAUNA OF NEW ZEALAND

by A. W. B. POWELL.

FOR the convenience of those using my " Shellfish of New Zealand " 2nd. edition, 1946 (Messrs. Whitcombe and Tombs Ltd., Auckland) here are the subsequent additions and emendations.

NOTE :—Rossian Province is now replaced by Antipodean An.) (Powell, 1951) and Macquarie Island is Kerguelenian (K.).

PELECYPODA.

4—*Nucula castanea* A. Adams, 1856, a synonym of 3. *nitidula,* A. Adams 1856 (Fleming, 1951)

15—*Nuculana (Saccella) hedleyi* Fleming, 1951. nom. nov. for *N. fastidiosa* of Hedley non. A. Adams, 1856.

Thestyleda Iredale, 1929 (Type : *Leda ramsayi* Smith).

16.1—*investigator* Dell, 1952. Tasman Sea.★

17.1—*Ledella librata* Dell, 1952. Tasman Sea. ★

18.1—*Ovaleda powelli* Dell, 1950. A ★

Austrotindaria Fleming, 1948 (Type : *A. wrighti* Fleming).

21.1—*wrighti* Fleming, 1948. F ★

37.1—*Lissarca stationis* Fleming, 1948. F ★

38 —*Lissarca? trapezina* (Bernard) refer to *Austrosarepta* 40.1 (Fleming, 1948).

57.1—*Perrierina georgiana* Fleming, 1948 F ★

57.2—*Perrierina matai* Fleming, 1948. F ★

57.3—*Perrierina perstriata* Fleming, 1948. F ★

57.4—*Perrierina subquadrangula* Dell, 1952. C ★

72.1—*Pecten novaezelandiae rakiura* Fleming, 1951, F.M. *(Notovola* a synonym of *Pecten).*

74.1—*Chlamys (Mimachlamys) suprasilis crepusculi* Fleming, 1948. F ★

77 —*Chlamys (Mimachlamys gemmulata* (Reeve) 1853. C.M.A.

76 —*Chlamys (Mimachlamys) gemmulata radiata* (Hutton) 1873 F

78.1—*Chlamys (Mimachlamys) taiaroa* Powell, 1952. F ★

80 —*Chlamys (Mimachlamys) gemmulata consociata Smith,* 1915. A (Fleming, 1951).

81 —*Chlamys (Zygochlamys) delicatula* (Hutton) 1873 (synonyms *campbellicus* Odhner, 1924 and 82—*subantarctica* Hedley, 1916) (Powell, 1950).

96.1—*Limatula hodgsoni* (Smith) 1907. K ★ (Tomlin, 1948).

96.2—*Limatula pygmaea* (Philippi) 1845. K ★ Tomlin, 1948).

110.1—*Kidderia aupouria fiordlandica* Fleming, 1948. F ★

111.1—*Kidderia marshalli* Fleming, 1948. F ★

124.1—*Cuna mendica* Dell, 1952. Tasman Sea. ★

132 —*Venericardia purpurata difficilis* Deshayes, a synonym of *purpurata* (Deshayes) 1854 (Fleming, 1951).

143.1—*Condylocardia mernoo* Dell, 1952. C ★

Lucinoma Dall, 1901. (Type : *Lucina filosa* Stimpson).

153.1—*galathea* Marwick, 1953. F ★

160.1—*Thyasira peroniana waikanae* Fleming, 1950. C. *(Prothyasira* a synonym of *Thyasira).*

Genaxinus Iredale, 1930 (Type : *Thyasira albigena* Hedley).

162 —*otagoensis* (Suter, 1913) F ★

162.1—*cookianus* Fleming, 1950. C ★

Maorithyas Fleming 1950 (Type: *M. marama* Fleming)

162.2—*marama* Fleming, 1950. F ★

164.1—*Lasaea rossiana tutanekai* Fleming, 1948. F ★

194.1—*Rochefortula profunda* Dell, 1952 Tasman Sea. ★

190.1—*Mysella henryi* Fleming, 1948. F ★

190.2—*Mysella lachlani* Dell, 1952. C ★

190.3—*Mysella hounselli* (Powell) 1931. C ★ (Recent record of upper Pliocene species) (Dell, 1952).

190.4—*Mysella morioria* Dell, 1952. M

200.1—*Notolepton umbonatum* (Smith) 1885. K ★ (Tomlin, 1948).

Tahunanuia Powell, 1952 *(T. alata* Powell).

200.2—*alata* Powell, 1952. A.C. ★

200.3—*trigonia* Powell, 1952. An. ★

219 —*Tellinella charlottae* (Smith) 1885. (Synonym, Recent records of *ferrari* Marwick, 1931. Omit 224 under *Maoritellina)* (Fleming, 1951).

219.1—*Tellinella eugonia* (Suter) 1913. C ★ (Recent record of upper Pliocene species) (Fleming, 1951).

Maoritellina Finlay, 1926 (a synonym of Tellinella which includes 225 and 226) (Fleming, 1951).

Cyclomactra Dall, 1895 (Type: *Mactra tristis* Reeve).

235 —*ovata* (Gray, 1843).

236 —*tristis* Reeve, 1854 (*rudis* Hutton 1873 is a synonym) (Marwick, 1948).

Spisula (Crassula) Marwick, 1948 (Type: *Mactra aequilateralis* Deshayes) (for 240).

275.1—*Panopea smithae* Powell, 1950. F ★

Hunkydora Fleming, 1948 (Type: *Thracia transenna* Suter).

282 —*australica novozelandica* (Reeve) 1859 (-*transenna*). Remove from *Thraciidae* and place in *Myochamidae,* 291.1 (Fleming, 1951).

295.1—*Cuspidaria willetti* Fleming, 1948, F.A. ★

295.2—*Cuspidaria aupouria* Dell, 1950. A ★

297.1—*Austroneaera wellmani* Fleming, 1948. F ★

GASTROPODA

301.1—*Scissurella stellae* Fleming, 1948. F ★

302.1—*Schizotrochus regius* (Mestayer) 1916. A.F. ★ (Fleming, 1948).

313 —Subgenus *Paua* Fleming, 1952 for *Haliotis iris* Martyn.

314 —Subgenus*Notohaliotis* Cotton & Godfrey, 1933, includes *australis* Gmelin.

318 —*Haliotis (Sulculus) virginea crispata* Gould, 1847. A. (Powell, 1952).

324 —*Tugali suteri sutherlandi* Fleming, 1948. F ★

331.1—*Monodilepas monilifera cookiana* Dell, 1952. C ★

368 —*Micrelenchus sanguineus sanguineus* (Gray) 1843 (*oliveri* Iredale, 1915, is a synonym) (Fleming, 1948).

376.1—*Micrelenchus sanguineus cryptus* Powell, 1946.

369 —*Micrelenchus caelatus caelatus* (Hutton) 1884.

370 —*Micrelenchus caelatus elongatus* (Suter) 1897.

370.1—*Micrelenchus caelatus bakeri* Fleming, 1948. F ★

372 —*Micrelenchus caelatus morioria* Powell, 1933.

371 —*Micrelenchus caelatus mortenseni* (Odhner) 1924.

386 —*Margarella rosea* (Hutton) 1873 (*decepta* Iredale is a synonym. Dell, 1950).

Venustas Finlay, 1926 (Type: *Trochus tigris* Martyn) (*Maurea* Oliver 1926, and *Mucrinops* Finlay 1926, are synonyms. Dell 1950).

393.1—*Venustas tigris chathamensis* Dell, 1950. M ★
393.2—*Venustas benthicola* Dell, 1950. C ★
395.2—*Venustas pellucida forsteriana* Dell, 1950. F ★
395.3—*Venustas pellucida haurakiensis* Dell, 1950. A ★
399.1—*Venustas foveauxana* Dell, 1950. F ★
399.2—*Venustas megaloprepes* (Tomlin) 1948. K ★
403.1—*Venustas punctulata multigemmata* Powell, 1952. F ★
403.2—*Venustas blacki* Powell, 1950. F ★

Cyclostrema Marryat, 1818 (Type: *C. cancellata* Marryat) (*Munditia* Finlay, 1926 is a synonym).

428.1—*Lodderena nana pooki* Fleming, 1948. F ★
468.1—*Cirsonella accelerans* Fleming, 1948. F ★

477.1—*Crosseola cookiana* Dell, 1952. C ★

Tasmocrossea Dell, 1952 (Type: *T. benthicola* Dell).

477.2—*benthicola* Dell, 1952. Tasman Sea. ★

Omphalorissa Iredale, 1933 (Type: *Georissa multilirata* Brazier).

494 —*purchasi* (Pfeiffer) 1862. (Dell, 1952).

Cocculina Dall, 1881 (Type: *C. rathbuni* Dall).

499.1—*cervae* Fleming, 1948. ★
550.1—*Murdochia filicosta* Powell, 1948. Three Kings Is.
550.2—*Murdochia annectens* Powell, 1948. Three Kings Is.
550.3—*Murdochia hirsutissima* Powell, 1951. Three Kings Is.
562.1—*Zelaxitas fiordlandica* Fleming, 1948. F ★
591.1—*Subonoba* n.sp. (Not. *S. bickertoni* Hedley, 1916) (Tomlin, 1948) K ★

Ovirissoa Hedley, 1916 (*Rissoa adarensis* Smith).

591.2—n.sp. Not *O. fraudulenta* Smith, 1907) (Tomlin, 1948) K ★
645.1—*Coenaculum tertium* Dell, 1952. C ★
652.1—*Linemera bountyensis* (Dell) 1950. An. ★ (Haurakia).
654.1—*Lironoba matai* Dell, 1952 C ★
661.1—*Nobolira hinemoa* Fleming, 1948. F ★

Eatoniella Dall, 1876.

707.1—*kerguelenensis* Smith, 1875 K ★ (Tomlin, 1948).

Ruapukea Dell, 1952 (Type: *R. carolus* Dell).

728.1—*carolus* Dell, 1952. F ★

Hinea Gray, 1847.

759.1—*braziliana* (Lamarck) 1822. A. (Powell, 1952).

Eumetula Thiele, 1912. (Type: *E. dilecta* Thiele).

792.1—*macquariensis* Tomlin, 1948. K ★
799 —*Serpulorbis* Sasso, 1827 replaces *Vermicularia* (Morton, 1951).
799.1—*Serpulorbis aotearoicus* Morton, 1951 A
801 —*Novastoa lamellosa* Hutton, 1873 replaces *N. zelandica* Q & G (Morton, 1951).
842.1—*Uberella denticulifera* (Marwick) 1924. F.C. ★ Recent records of this Pliocene species (Dell, 1950).

Falsilunatia Powell, 1951 (Type: *Natica soluta* Gould).

843 —*pisum* (Hedley, 1916) (remove from Friginatica).
843.1—sp. (-*fartilis* of Tomlin, 1948, non Watson, 1881) K
851.1—*Lamellaria conica* Smith, 1902. K ★ (Tomlin, 1948).
863 —*Monoplex australasiae* Perry, 1811 (replaces *M. parthenopeum* of N.Z. authors) (Powell, 1952).
866.1—*Charonia rubicunda* (Perry) 1811. A. (Powell, 1952). (*euclioides* Finlay, 1926 synonymised with *capax*).

869.1—*Mayena australasia vossi* Powell, 1952. A ★

Cymatona Iredale, 1929. (Type: *Nassaria kampyla* Watson.

872.1—n.sp. (*-Nassaria kampyla:* Tomlin not of Watson, 1883) (Tomlin, 1948) K ★ (will be described elsewhere).

881.1—*Xenophalium (Xenogalea) matai* Powell, 1952. F

884.1—*Tonna dolium* (Linnaeus) 1758. A

917.1—*Zerotula neozelanica* (Suter) 1908 (removed from 432, under *Liotella).*

Pyramidellidae (918-1,000). These are now known to belong to the *Opisthobranchia* and should be located near to the *Acteonidae.*

1015.1—*Balcis maui* Dell, 1952. Tasman Sea. ★

Melanella Bowdich, 1822.

1017.1—cf *laseroni* Hedley, 1916. K. (Tomlin, 1948).

1031.1—*Proximitra banksi* Dell, 1951. C ★

1041.1—*Austromitra brunneacincta* Powell, 1952. A ★

1041.2—*Austromitra zafra* Powell, 1952. A ★

1041.3—*Microvoluta obconica* Powell, 1952. A ★ (Place 1236 and 1237 along with it in *Mitridae).*

1060.1—*Buccinulum* (Evarnula) *benthicola* Dell, 1951. C ★

1089.1—*Austrosipho (Verconella) adusta worthyae* Powell, 1947. A ★

1091.1—*Austrosipho (Verconella) adpressa* Powell, 1947 A ★

1090.2—*Austrosipho (Verconella) dispar* Powell, 1947 C ★

1090.3—*Austrosipho (Verconella) jeakingsi* Powell, 1947. C ★

1090.4—*Austrosipho (Verconella) fairfieldae* Powell, 1947. C ★

Ellicea Finlay, 1928 (Type: *Siphonalia orbita* Hutton).

1095.1—*recens* Dell, 1951. C ★

Probuccinum Thiele, 1912.

1098.1—n.sp. (*tenerum:* Tomlin, 1948, not of Smith) K ★

Prosipho Thiele, 1912.

1098.2—sp. (*certus:* Tomlin, 1948, probably not of Thiele) K ★

1098.3—sp. (*madigani:* Tomlin, 1848, not of Hedley) K ★

1104.1—*Cominella virgata brookesi* Powell, 1952. A

1118.1—*Fax mirabilis canturiensis* Dell, 1951. C ★

1118.2—*Fax mirabilis powelli,* Fleming, 1948. F ★

1121.1—*Nassarius spiratus* (A. Adams, 1852) A.

1122 —*Nassarius dissimilis* Watson, 1886, a synonym of 1123, *ephamillus* Watson, 1882.

1125.1—*Coluzea mariae* Powell, 1952. F ★

Trophon Monfort, 1810 (Type: *Trophon magellanicus* Gmelin).

1133 —n.sp. (*-albolabratus* of Hedley, 1916 and Tomlin, 1948, but not of Smith, 1875). K ★

1133.1—n.sp. (*-declinans* of Tomlin, 1948, not of Watson, 1882). K ★

1146.1—*Axymene traversi aucklandica* (Smith) 1902. Remove from 1141 under Xymene (Fleming, 1951).

1145 —*Axymene traversi erectus* (Suter, 1909) (Fleming, 1951).

1150 —*Axymene traversi convexus* (Hutton) 1873.

1161.2—*Uttleya marwicki* Powell, 1952. C ★

1161.3—*Uttleya williamsi* Powell, 1952. A ★

Tolema Iredale, 1929 (Type: *Purpura sertata* Hedley).

1161.4—*peregrina* Powell, 1947. A ★

1176.1—*Zeadmete barkeri* Powell, 1952. A ★

1178.1—*Admete* sp. (*-Harpovoluta vanhoffeni:* Tomlin, 1948, non Thiele, 1912) K ★

1203.1—*Liratilia conquisita nestoris* Fleming, 1948 F ★

1215.1—*Macrozafra cophinodes* (Suter) 1908 F ★

1223.1—*Pachymelon (Palomelon smithi)* Powell, 1950 F ★
1238.1—*Baryspira southlandica* Fleming, 1948. F ★

Marginellidae, 1243-1267.

Volvarinella Habe, 1951 (Type: *V. makiyamai* Habe).

This should include the New Zealand species *amoena, aoteana, cairoma, fusula, hebescens, lurida, stewartiana, subfusula,* and possibly *subamoena.*

Kagomea Habe, 1951. (Type: *Marginella novemprovincialis* Yokoyama)

This includes *ficula* Murdoch and Suter.

Microvulina Habe, 1951 (Type: *M. nipponica* Habe).

This includes *angasi* Crosse.

1270.1—*Fenestrosyrinx nexilis recens* Fleming, 1948 F★
1336.1—*Stilla fiordlandica* Fleming, 1948. F ★

Austrodiaphana Pilsbry, 1893 (Type: *Aplustrum brazieri* Angas).

1391.1—*colei* Fleming, 1948. F ★
1391.2—*maunganuica* Powell, 1952. A ★
1501.1—*Thalassohelix prousei* Powell, 1952. L.S.
1521.1—*Allodiscus fallax* Powell, 1952. L.N.
1521.2—*Allodiscus spiritus* Powell, 1952 L.N.
1521.3—*Allodiscus turbotti* Powell, 1948. Three Kings Is.

Therasiella Powell, 1948 (Type: *Nanina* (?) *celinde* Gray).

Includes 1531, *celinde* Gray; 1537 *pectinifera* Powell: and 1534 tamora Hutton.

Otochonchidae

Includes Nos. 1486, 1487 and 1489. Omit *Helicarionidae* and place following *Flammulinidae.*

Maoriconcha Dell, 1952 (Type: *Helicarion oconnori* Powell).

1560.1—*oconnori* (Powell) 1941, removed from 1486.
1560.2—*fiordlandica* Dell, 1952. L.S.

Flammoconcha Dell, 1952 (Type: *Helicarion (Peloparion) cumberi* Powell).

1560.3—*cumberi* (Powell) 1941, remove from 1487.
1560.4—*stewartensis* Dell, 1952, L. Stewart Island.

Obanella Dell, 1952 (Type: *Egestula spectablilis* Powell).

1597 —*spectabilis* (Powell) 1928.
1597.1—*allanae* Dell, 1952.
1597.2—*rimutaka* Dell, 1952. L.N.

Geminoropa Iredale, 1933 (Type: *Helix antialba* Beddome).

1627 —*vortex* (Murdoch) 1897 (Dell, 1952).

(Cavelliropa) Dell, 1952 (Type: *Diplomphalus subantialba* Suter) subgenus of *Geminoropa.*

Includes all species listed as Cavellia except 1623, *biconcava* Pfeiffer.

1629.1—*oconnori* (Dell) 1950. L.S.
1636.1—*Laoma labyrinthica* Powell, 1948. Three Kings Is. L.
1679.1—*Phrixgnathus subariel* Powell, 1948. Three Kings Is. L.
1679.2—*Phrixgnathus blacki* Powell, 1951. Three Kings Is. L.
1679.3—*Phrixgnathus flemingi* Dell, 1950, Snares Is. L.
1679.4—*Phrixgnathus laqueus* Dell, 1950, Snares Is. L.
1679.5—*Phrixgnathus forsteri* Dell, 1952. L.S.

Laomarex Powell, 1948 (Type: *L. sericea* Powell).

1679.6—*sericea* Powell, 1948. Three Kings Is. L.
1680.1—*Paralaoma buddlei* Powell, 1951. Three Kings Is. L.
1680.2—*Paralaoma regia* Powell, 1948. Three Kings Is. L.
1680.3—*Paralaoma turbotti* Powell, 1948. Three Kings Is. L.
1681.1—*Placostylus (Basileostylus) bollonsi arbutus* Powell, 1948. Three Kings Is. L.

1681.2—*Placostylus (Basileostylus) bollonsi caperatus* Powell, 1948. Three Kings Is. L.

1686.1—*Placostylus Maoristylus ambagiosus hinemoa* Powell, 1947. L.N.

1686.2—*Placostylus (Maoristylus) ambagiosus worthyi* Powell, 1947. L.N.

1686.3—*Placostylus (Maoristylus) ambagiosus lesleyae* Powell, 1947.

1686.4—*Placostylus (Maoristylus) ambagiosus spiritus* Powell, 1947. L.N.

1686.5—*Placostylus (Maoristylus) ambagiosus keenorum* Powell, 1947. L.N.

1686.6—*Placostylus (Maoristylus) ambagiosus watti* Powell, 1947. L.N.

1686.7—*Placostylus (Maoristylus) ambagiosus michiei* Powell, 1951. L.N.

1686.8—*Placostylus (Maoristylus) ambagiosus gardneri* Powell, 1951. L.N.

1686.9—*Placostylus (Maoristylus) ambagiosus whareana,* Powell, 1951. L.N.

1686.10—*Placostylus (Maoristylus) ambagiosus hancoxi* Powell, 1951. L.N.

1686.11—*Placostylus (Maoristylus) ambagiosus pandora* Powell, 1951. L.N.

1686.12—*Placostylus (Maoristylus) ambagiosus paraspiritus* Powell, 1951. L.N.

1689.1—*Rhytida greenwoodi webbi* Powell, 1949. L.S.

1692.1—*Rhytida forsythi* Powell, 1952. L.N.

1698.1—*Rhytida hadfieldi* Powell, 1949. L.S.

1708.1—*Paryphanta (Powelliphanta) lignaria lusca* Powell, 1949. L.S.

1714.2—*Paryphanta (Powelliphanta) lignaria ruforadiata* Powell, 1949. L.S.

1717.1—*Paryphanta (Powelliphanta) rossiana patrickensis* Powell, 1949. L.S.

1728.4—*Paryphanta (Powelliphanta) traversi latizona* Powell, 1949. L.N.

(Rhytidarex) Powell, 1948 (Type: *Rhytida (R.) johnsoni* Powell) subgenus of *Rhytida.*

1700.2—*johnsoni* Powell, 1948. Three Kings Is. L.

1700.3—*buddlei* Powell, 1948. Three Kings Is. L.

1732 —*Schizoglossa novoseelandica barrierensis* Powell, 1949. L.N.

1732.1—*Schizoglossa worthyae* Powell, 1949. L.N.

(Delouagapia) Powell, 1952 (Type: *Gerontia cordelia* Hutton) subgenus of *Delos.*

1736.1—*cordelia* (Hutton) 1883. Removed to *Paryphantidae* from *Flammulinidae,* 1503.

CEPHALOPODA

Histiotenthis d'Orbigny, 1846 (Type: *Cranchia bonelli* Fer.).

1835 —*cookiana* Dell, 1951. C ★ (*-Callitenthis reversa:* Suter non Verrill).

Megalocranchia Pfeiffer, 1884 (Type: *M. maxima* Pfeiffer).

1838.1—pardus Berry, 1916. C ★ (Dell, 1951).

(Solitosepia) Iredale, 1926 (Type: *S. liliana* Iredale) subgenus of *Sepia.*

1839.1—*plangon* (Gray) 1849. A. (Powell, 1940).

Sepioloidea d'Orbigny, 1839 (Type: *Sepiola lineolata* Q & G) for 1840-*pacifica* T. W. Kirk.

1845 —omit subgenus *Macroctopus*

1845.1—*Octopus zealandicus* Benham, 1944 (omit *Paroctopus).*
1851 —*Argonauta tuberculata* Shaw a synonym of *A. nodosa* Solander.

Japetella Hoyle, 1885 (Type : *prismatica* Hoyle).
1855.1—*diaphana* Hoyle, 1855. A ★

Eledonello Verrill, 1884 (Type : *E. pygmaea* Verrill).
1855.2—*pygmaea* Verrill, 1884. C ★

REFERENCES

Dell, R. K. 1950. Dom. Mus. Rec. Zool. vol. 1, Nos. 3-6, pp. 21-58.
Dell, R. K. 1951. Rec. Cant. Mus. vol. 6, No. 1, pp. 53-60.
Dell, R. K. 1951. Zool. Publ. No. 14. Vict. Univ. Coll., pp. 1-6.
Dell, R. K. 1952. Trans. Roy. Soc. N.Z. vol. 79, pts. 3-4, pp. 412-418.
Dell, R. K. 1952. Dom. Mus. Rec. Zool. vol. 1, Nos. 7-10, pp. 59-107.
Dell, R. K. 1952. Dom. Mus. Bull. No. 16, pp. 1-157.
Dell, R. K. 1953. Trans. Roy. Soc. N.Z. vol. 81, pt. 1, pp. 72-92.
Fleming, C.A. 1948 Trans. Roy. Soc N.Z. vol. 77, pt. 1, pp. 72-92.
Fleming, C. A. 1950. Trans. Roy. Soc. N.Z. vol. 78, pts. 2-3 pp. 251 254.
Fleming, C. A. 1951. Trans. Roy. Soc. N.Z. vol. 79, pt. 1, pp. 126-139.
Fleming, C. A. 1952. Trans. Roy. Soc. N.Z. vol. 80, pt. 2, pp. 229-232.
Marwick, J. 1948. N.Z. Geol. Surv. Pal. Bull. No. 16, pp. 1-38
Marwick, J. 1953. N.Z. Journ. Sc. Tech. Sec. B, vol. 35, No. 1, pp. 109-112.
Morton, J. E. 1951. Trans. Roy. Soc. N.Z. vol. 79, pt. 1, pp. 1-51.
Powell, A. W. B. 1947. Rec. Auck. Inst. Mus. vol. 3, No. 3, pp. 161-169.
Powell, A. W. B., 1947. Rec. Auck. Inst. Mus. vol. 3, No. 3, pp. 170-172.
Powell, A. W. B. 1947. Rec. Auck. Inst. Mus. vol 3, No. 3, pp. 173-188.
Powell, A. W. B. 1948. Rec. Auck. Inst. Mus. vol. 3, No.s. 4-5, pp. 273-290
Powell, A. W. B. 1949. Rec. Auck. Inst. Mus. vol. 3, No. 6, pp. 347-367.
Powell, A. W. B. 1950 Rec. Auck. Inst. Mus. vol. 4, No. 1, pp. 61-81.
Powell, A. W. B. 1951. Rec. Auck. Inst. Mus. vol. 4, No. 2, pp. 127-133.
Powell, A. W. B. 1951. Rec. Auck. Inst. Mus. vol. 4, No. 2, pp. 134-140.
Powell, A. W. B. A. W. B. 1951. Discovery Reports, vol. 26, pp. 47-196.
Powell, A. W. B. 1952. Rec. Auck. Inst. Mus. vol. 4, No. 3, pp. 163-168.
Powell, A. W. B. 1952. Rec. Auck. Inst. Mus. vol. 4, No. 3, pp. 169-185.
Tomlin, J. R. le B. 1948. B.A.N.Z.A.R.E. Rep. Ser. B., vol. 5, pp. 221-232.

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Watene, Miss B. Phyllis, Waihou Bay, via Opotiki.	1, 3.
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Williams, Mrs. H., 33 Wexford Road, Kilbirnie, Wellington.	
Williams, E. G., 49, Pitau Road, Mt. Maunganui, Tauranga.	1.
Whitten, Rev. H. E., 1710 Great North Road, Avondale, S.W.3.	1, 3.
Willis, Miss Barbara, 460 Queen Street, Auckland, C.1.	1 to 5.
Willis, E., 460 Queen Street, Auckland, C.1.	1 to 5.
Wilson, Mrs. M. E., 31 Oliver Street, Pt. Chevalier, W.3.	1 to 5.
Wise, K., c/o. Plant Diseases Div. P.B. Auckland.	1, 3, 5.
Wyatt, Mrs. J., 220 Richmond Road, Grey Lynn, W.2.	1 to 5.

1. N.Z. Sea Shells. 2. Foreign Sea Shells. 3. N.Z. Land Shells.
4. Foreign Land Shells. 5. Fossil Shells.

N.S. Gazette print.

Mrs. E. Willis

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CONCHOLOGY SECTION
OF THE
AUCKLAND MUSEUM

BULLETIN No. 10

AUCKLAND, NEW ZEALAND

NOVEMBER 1954

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CONCHOLOGY SECTION OF THE AUCKLAND MUSEUM
BULLETIN No. 10

EDITORIAL

THERE has been no slackening of interest during the current year's activities.

We have had very well attended monthly meetings, some quite profitable field days and have made considerable progress with the Manukau Survey.

Some of our members have, this year, taken greater interest in the microscopic molluscan fauna, the result of this being the finding of quite a number of undescribed species.

Not the least interesting, by any means has been the discovery of further specimens of some of our very rare species, previously known by one or two specimens—or even an imperfect juvenile shell.

There is justification for saying that we have learnt a good deal this year.

To all who have contributed, directly or indirectly, to this publication we tender our thanks.

E. N. & N. W. GARDNER, Co-Editors,
1st November, 1954

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COLLECTING PARYPHANTA

by S. TRIGANCE.

CHRISTMAS Holidays, 1953-54 were planned eleven months in advance, to be primarily devoted to tracking down *Paryphanta* in its various habitats in the north and north-western points of the South Island.

In the first instance, this entailed an initial journey of 470 miles from Temuka to Collingwood; our policy in most cases being to travel to the farthest objective first and work back from there.

Two days sufficed to cover the distance, and on the morning of the third day I immediately inquired from local residents as to the nearest place *Paryphanta* could be found. We were told Mt. Burnett, some three miles away to the north-west.

The weather was inclined to drizzle but *Paryphanta* was what I had come for, and *Paryphanta* I was going to get, rain or shine. Donning rain capes, we set off on foot from the road to Burnett's face, a distance of a mile, climbed through dripping wet forest to a height of approximately 500 feet, then we began scratching about the undergrowth and raking through dead leaves with our hands. In a few seconds our first self-collected specimens, live *Paryphanta gilliesi,* was our reward, and a great thrill it was. Within the space of an hour, some 30 specimens were collected, about half being alive.

Very wet, and somewhat tired, we returned to base camp at Collingwood. Two days later, after a fruitless search as far afield as Patarau River, we returned to Burnett and repeated the previous effort for a similar reward.

The next move was to Motueka, in order to explore Takaka Hill area. The road running in from the top of the hill to Canaan was our objective. After scraping along a track meant for anything but a car, for about 4 miles, we came to a wooded spot which looked worth a prospect. After half an hour's search we obtained 2 live and 2 dead specimens of *Paryphatana hochstetteri;* further searching proved fruitless.

We found out later that to obtain this variety in any quantity, one had to travel about 8 miles in. However, wishing to retain the car in one piece, futher reconnisance was ruled out with regret, because Paryphanta hochstetteri is indeed a handsome trophy for the hunter.

Camp was now transferred to Picton, and enquiries were made of the launch men as to accessible places to obtain specimens of *Paryphanta bicolour.* The result was an all day trip, starting at 8 a.m. and reaching Bluemine Island in the north-west channel of Queen Charlotte Sound at 11 a.m.

The launch nosed into flat rock to disembark unsuspecting collectors. Instructions were given to be waiting on the other side of the Island at 4.45 p.m. to be picked up for the return journey. No sooner had we waved the launch "good-bye," than we found that the only way off the flat rock was an almost vertical climb for about 200 feet—hauling ourselves upward by sheer physical effort. This marathon took all of 2 hours. However, here was reached a small flattish glade where refreshment was partaken of—an urgent necessity to replace the system's calory content.

We were about to move on when our eyes alighted on some *Paryphanta bicolor* almost at our feet; a hasty search of this small area produced some half dozen specimens, so felt that the preceding exertion was not wasted.

It was urgent that progress towards the other side of the island be made, as the distance and the condition of the "going" were unknown factors. The general direction having been decided upon, a move was made at this 200 feet level, around the hillside with the idea of striking a water-course. After traversing for about a mile, such a course "opened up" (I use this term because since our arrival on the island, dense, wooded country had been encountered most of the time). Use of such a course was deemed necessary on two counts. Firstly, to gain the summit of the island without unnecessary exertion, and secondly, a greater chance of obtaining specimens where the terrain would be somewhat more moist.

This proved a wise decision as the summit was gained with comparative ease, and the collecting of some 30 *Paryphanta bicolour* was pure joy.

We were informed that the opposite side of the island would present no difficulty as it was mostly open country. Unforunately this open country consisted of tangled manuka scrub and fern, from waist to head high, and was well nigh impenetrable. Once again, the big decision was made—to force a track to the nearest water-course, with the prospect of an easy descent.

We duly reached a "course' and had about an hour to make the coast on time, from 500 feet up and half a mile distant as the crow flies.

The descent was a nightmare journey, having to descend sheer drops of up to 20 feet by hanging on to supplejacks, and suspended over miniature waterfalls, wading through mud when no rock footholds were available. We eventually broke out to a clear spot about 100 feet level, to find the launch waiting for us. We had really expected to find it gone as we were then about half an hour overdue. The last 100 feet, conisting of rock and tussock grass was made in double quick time. Fortune had really favoured us in the end, as the launch had gone to the assistance of another with engine trouble, and had just arrived.

A wade into the water, a quick haul aboard, and then a cold journey back to Picton.

A memorable day, and, yet, it was really worth it—the prize, three dozen Paryphanta bicolour, and the end of the 1953-54 Christmas holidays.

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NOTES ON THE SUTER COLLECTION

OF NEW ZEALAND MOLLUSCA — 1.

by C. A. Fleming, N.Z. Geological Survey.

HENRY Suter (1841-1918) was born in Zurich, Switzerland, was trained as an analytical chemist, and then joined his father's business (silk manufacture). He came to New Zealand at the end of 1886. As a boy he was interested in natural history and was friendly with such prominent naturalists as the chonchologist Mousson. In New Zealand, he tried farming in the Forty-Mile Bush (Wairarapa) and was for a time assistant manager of Mount Cook Hermitage, but subsequently through the interest of Hutton he was able to work in Canterbury Museum and at other scientific institutions.

"Shortly after arriving in this beautiful colony, in January, 1887," (he wrote in his first paper, 1890) "I began to collect land and fresh-water shells, for a few weeks near Wellington, and afterwards . . . . in the southern part of the Forty-Mile Bush." This first paper was followed by others in quick succession, first on New Zealnd terrestrial and fresh-water mollusca (groups that he had studied in Switzerland), then on land mollusca from other parts of the world. He was persuaded to abandon work on foreign land shells and to concentrate on New Zealand mollusca, publishing in all about 70 papers between 1890 and 1912. In 1913 he produced his *Manual of the New Zealand Mollusca,* a volume of 1,120 pages (with an atlas of plates, 1915) published by the Government in response to a request by the New Zealand Institute in 1906. Subsequently, as an old man, he was employed by the New Zealand Geological Survey, revising Tertiary Mollusca and describing new species; the results of this work appeared as *New Zealand Geological Survey Paleontological Bulletins* 2, 3, 5 and 8.

According to Hedley, Suter was an expert collector. His published work on living New Zealand mollusca was based almost entirely on his own private collection built up in a quarter century of devoted enthusiasm, supplemented by overseas species obtained by exchange with such well-known conchologists as Dall in America and Hedley, Verco, Pritchard and May in Australia. After his death, Suter's collection was purchased by Wanganui Public Museum, largely through the influence of the late Dr. P. Marshall and Mr. R. Murdoch, leading workers on Tertiary Mollusca living in Wanganui during the nineteen-twenties. After Murdoch's death in 1923 and Marshall's departure from Wanganui some years later, the collection received little use, although it was always accessible to visiting students of mollusca, through the good offices of the Hon. Director, the late Mr. J. Grant. In 1946, the collection was purchased from the Trustees of Wanganui Public Museum by the New Zealand Geological Survey and was transferred to Wellington.

When received in Wellington, the collection was still esentially as Suter left it, except that alcohol had evaporated from some fluid preparations and many specimens had jumped from their correct card trays. The first task was to segregate type specimens, which were distributed through the collection in their appropriate systematic position, their tickets marked "type" in Suter's neat hand lettering. Types of species that Suter had relegated to synonymy (such as *Xenophora neozelanica, Drupa bollonsi)* were more difficult to identify because their tickets were turned over and re-lettered so that they showed no indication that they were types.

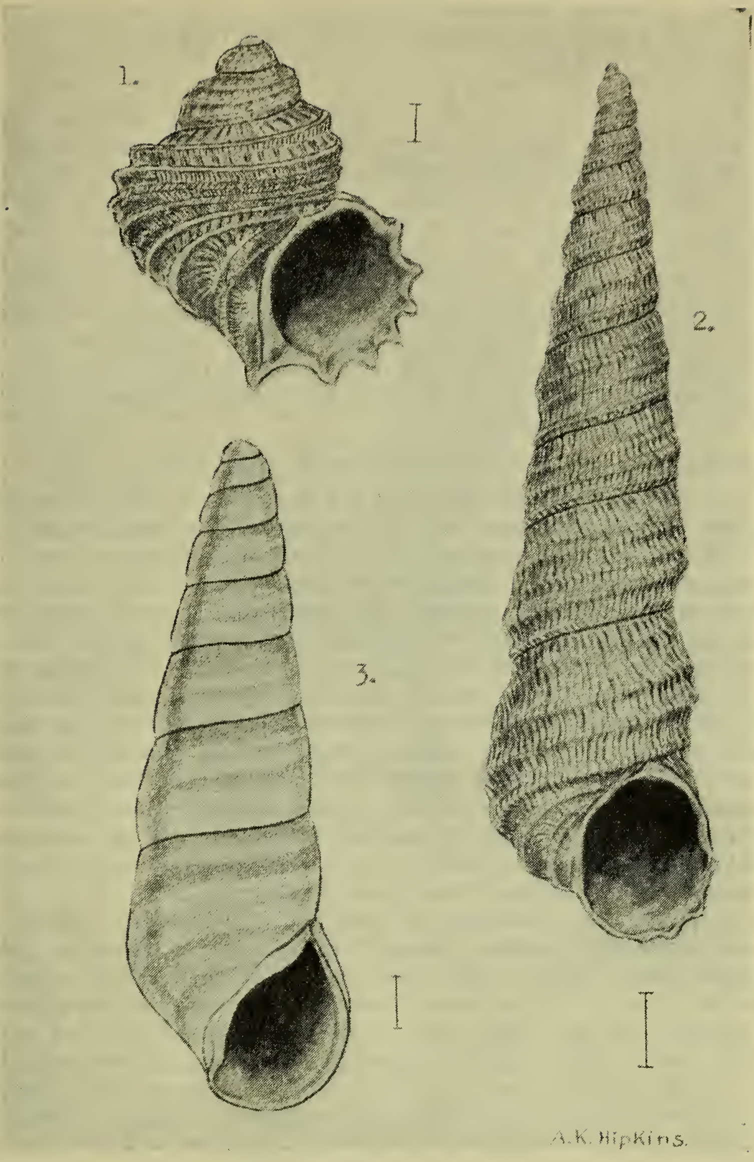
During the extraction of some types and re-arrangement of the collection in new drawers, some displaced specimens were restored to their trays, but many others cannot be confidently attached to their correct locality labels. Suter registered each "species lot" (i.e. one or more specimens from one locality) with a number which appears on the label but he often failed to mark the specimens themselves. Collectors should ink or gum a register number on all specimens that are not enclosed in labelled glass phials. Fortunately minute species in the Suter Collection are housed in glass phials bearing a gummed numbered ticket corresponding with the register number on the label.

When he described a new species for more than one specimen Suter seldom segregated the holotype but labelled the whole series "type." Later workers (Laws Powell, etc.) have selected lectotypes from the syntypes of some species, but lectotypes have still to be chosen for others.

Most of the illustrations in the *Atlas of Plates* are drawings or photographs of specimens either in the Dominion Museum or in the Collection. Such figured specimens or hypotypes should be identified if possible and segregated with the primary types, because systematists have found new names on them. For instance, Iredale proposed the name *Mytilus maorianus nom. nov.* for the species described by Suter under the name *Mytilus magellanicus* Lamarck. The lectotype of *maorianus* is a specimen that Suter described, measured and figured in the Atlas. Suter did not mark the specimens he illustrated so some of them can never be identified. Only a few of the originals of illustration in the *Atlas* have been identified so far, and systematists should avoid basing names on them without handling the specimens.

One of the objects of the Geological Survey in buying the Suter Collection was to make it more readily accessible to serious students of mollusca than it had been during the 28 years following Suter's death. Paleontologists seldom have to deal with land and fresh-water mollusca, so the collections of these groups were deposited in the Dominion Museum, where they have had the benefit of fire-proof accommodation. It is satisfactory to report that the Suter Collection of New Zealand marine mollusca, after some years in the wooden building occupied by the Geological Survey at 156 The Terrace, is now housed in the Survey's "type museum," a fireproof converted garage at 93 Boulcott Street.

In future articles I hope to comment on Suter's specimens, group by group, in the hope that this will be of interest to collectors and of use to research workers.



SPECIMENS DREDGED FROM WHANGAROA HARBOUR AND STEPHENSON'S ISLAND, 3½ MILES FROM WHANGAROA HEADS

(1) *Crosseola errata* Finlay, 1926. 5 fms., inside Harbour.

(2) *Murdochella tertia* Finlay, 1930. 22 fms., Stephenson's Island.

(3) *Rissoina ficta,* Finlay, 1930. 22 fms., Stephenson's Island.
Brackets indicate approximate size of specimens.

A. K. HIPKINS.

THE SUTER COLLECTION

OF LAND AND FRESH-WATER MOLLUSCA.

by R. K. DELL.

THE Suter collection of land and fresh-water mollusca as acquired from Wanganui Museum has been deposited in the Dominion Museum. The following notes on these collections will give some indication of their scope and present condition. The foreign collections were arranged geographically, and were carefully labelled and curated. It would seem that Suter had devoted more care to his land snail collections than is evident in the marine collections (as noted by Dr. Fleming). Many of the land shells of course are stored in numbered glass tubes and most of the larger shells are also numbered so that the jumping that has taken place has been readily rectified. The labelling, registration and cataloguing of the Suter Collection is, on the whole, of the very highest standard.

FOREIGN LAND AND FRESH-WATER MOLLUSCA.

The collection of foreign land and fresh-water mollusca as received by the Dominion Museum was not complete. The areas covered are as follows: Hawaii, Polynesia, New Caledonia, Melanesia, Australia, Tasmania, Indo-Malaya, Philippines, China, Japan, India, North and South Africa and South America. Suter's catalogue shows that originally the geographical coverage was complete and it would appear that at some stage he pruned his collections. It is obvious that a definite plan was followed and that he retained the molluscs from countries bordering the Pacific (apart from North America), and those from the major southern lands. The main obvious areas that are missing are North America, West Indies and Europe (which must have been originally extensively covered). It is difficult to trace the fate of these collections but from the fact that some of the shells from these "missing" collections are in the Canterbury, Dominion and Wanganui Museums it would appear that Suter dispersed them rather haphazardly.

With large collections of land snails it is always difficult to decide whether they shall be arranged systematically or regionally. Both methods have distinct advantages. At the moment Suter's Foreign Land and Fresh-water mollusca are being incorporated into the Museum Collections and the arrangement is quite well suited for land snails which usually have restricted ranges but it is not as practicable for fresh-water mollucs, some of which especially in genera like *Neritina* and *Melania* apparently have wide geographical ranges. Eventually the fresh-water mollusca in the Museum Collections will probably be arranged systematically rather than geographically.

The collection has great value for New Zealand workers because it contains much useful material for comparative purposes. The smaller shells are quite well represented, an unusual feature of most collections. One interesting point is that the collection contains a few types of Brazilian land snails originally described by Suter.

NEW ZEALAND LAND AND FRESH-WATER MOLLUSCA.

This collection which is the basis of the relevant sections in the *Manual of New Zealand Mollusca* is kept separate in the Museum Collections and no original labels will be altered. Any additions to the labelling (correction of identification, etc.) will be added on separate labels. Such a course of action is necessary because final judgment on which species Suter was dealing with under a certain name in the Manual depends upon the specimens so labelled in his collection.

The collection is weakest in such groups as *Placostylus* and *Paryphanta* which are represented by comparatively few specimens, many of them wrongly localised. It is rich in the smaller land snail groups although the range of localities available is often rather restricted. The Suter Collection does not in any way give complete geographical coverage, of the New Zealand land snail fauna. Suter's achievement in compiling the Manual with only sparse and sporadic financial assistance is undoubted (and no criticism of his work should be allowed to detract from the appreciation of this effort). The writer in preparing papers on the land snails of Stewart Island and Fiordland and attempting a revision of the genus *Ptychodon* and the fresh-water mollusca of New Zealand has examined a large part of this section of the Suter Collection. The following general points have been noted and are mentioned here as a warning to those who use the Manual and as an indication of the directions in which future progress may be made.

First and foremost Suter's descriptions of minute details is often quite false. For example one cannot be sure that his descriptions of minute sculpture on protoconchs is accurate or that his statements on the presence or absence of fine microscopial sculpture between the axial ribs is true. The writer has noted this discrepancy between Manual descriptions and actual specimens on numerous occasions. A glance at the keys to such genera as *Charopa* and *Fectola* in the Manual will show how much Suter relied upon such details to distinguish between species. That such details are incorrect shows that a vast amount of revision is necessary. Also, Suter's measurements of small shells were often inaccurate. Probably his microscopical equipment was not of a high enough standard for close work on these minute shells.

One trait of character that seems amply proven in the collection is that Suter seldom, if ever, checked back on his specimens after a lapse of time. Once a specimen was identified he seldom checked it again. This is well exemplified in the case of *Ptychodon iredalia* Webster. In the Manual Suter quotes Webster's original description and gives no additional localities or other data. Yet the specimens upon which Suter based his South Island record *varicosa* Pfeiffer are definitely *iredalia* and the two forms are very distinct, though related.

The direction in which future work on the land and fresh-water mollusca of New Zealand must be developed seem to the writer to be as follows:

Revision of the fauna, genus by genus, refiguring all type specimens, revising Suter's nomenclature and giving as full distributional data as possible. An urgent need is for the re-examination and redescription of the type material deposited in Museums outside New Zealand, particularly the species described by Pfeiffer, including many of our common species, e.g. *Allodiscus dimorphus, A. granum, A. venulatus, Therasia decidua, Phenachohelix chordata, Ptychodon tau, P. varicosa and Cavelli biconcava.* The original descriptions of *Ptychodon tau* and *P. varicosa* for example made no mention of internal lamellae. Probably such a study will necessitate name changes. Some of Suter's species will undoubtedly prove to be synonyms and a number of new names will be needed.

Amongst the fresh-water shells the most obvious results will be to reduce the number of species and to change generic names. Much of this revision has been completed and the part dealing with *Hyridella* has been published. One interesting discovery is that a true *Physa* (probably the European *Physa fontinalis)* occurs in New Zealand almost certainly as an introduced species. It is the common shell in garden lily ponds and appears to be establishing itself in natural backwaters, e.g. backwaters of the Hutt River and small lakes in the Wairarapa.

One of Suter's fresh-water species that has always intrigued the writer is *Potamopyrgus subterraneus* described from a single specimen from an artesian well. The figure in the Manual shows the aperture in the centre of the body whorl. The resultant shape is so peculiar that the species has aroused a good deal of curiosity. The acual specimen is a quite normally shaped Potamopyrgus with a badly broken lip and the main mystery is how the figure was ever drawn as it is.

Once the systematics have been revised the relationships, origins and internal distribution of our land and fresh-water shells can be discussed on an up-to-date basis. At the moment such consideration are almost impossible.

Many of us tend to think of the *Manual of New Zealand Mollusca* as summing up all that was known at the time of the land and fresh-water mollusca of New Zealand. This is largely true of the systematics but it is far from true of the natural history of these animals. There is a large amount of material describing habits, appearance and structure of these molluscs tucked away in papers by Suter, mainly in the *Transactions of the New Zealand Institute,* prior to 1913. Amateur conchologists will find much of interest by delving into the original papers where Suter, the man, is often much more apparent than he is in the very formal, rather dry, *Manual of the New Zealand Mollusca.*

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FURTHER RECORDS
OF *AUSTROSUCCINEA ARCHEYI* POWELL

by Wm. P. THOMSON *and* A. H. JONES.

In his article, *Life History of Austrosuccinea archeyi* (Records of the Auckland Institute and Museum, Vol. 4, No. 1, December, 1950) Mr. A. W. P. Powell gives a complete listing at time of writing of all recorded finds of this interesting snail.

Further records of finds in the Mount Maunganui (Bay of Plenty) area made in October, 1950 and January, 1951 were published in the Auckland Muesum Conchology Club Bulletin No. 8 (November, 1952).

Hereunder are still further records from this same area and eastward along the Bay of Plenty; also from a new locality at Whangamata on the east coast of the Coromandel Peninsular.

AT MOUNT MAUNGANUI *by* Wm. P. THOMSON

In recording the results of investigations made in this area in January, 1951 (see Bulletin mentioned above), the writer reported that specimens were found only in one small area at Omanu Beach, about two miles along the coast from Mount Maunganui; and that searches made at Papamoa Beach, seven miles along the road, produced no results.

The question was raised as to whether or not these snails could be expected to survive at Omanu, seeing the area was being rapidly built on as a seaside resort, and because a good deal of industrial development was taking place at Mount Maunganui.

In December, 1953, opportunity was taken by the writer to make further and more extensive searches in this and other areas of the Bay of Plenty.

At Omanu I was able to go back to exactly the same spot as on my previous visit, and was pleased to find that it had not been disturbed to any extent. In a confined area of aproximately 4 sq. yds. I found 77 empty, but unbleached, shells in a very short time. They varied in size from 3.00 m.m. to 11.50 m.m., the average being 8.50 m.m.

Searching the dunes for about 1½ miles seaward, several very small colonies were found; these included two live specimens which measured 2.75 m.m. and 10 m.m. respectively. The live specimens were found in a small patch of moss, along with eight specimens of the introduced snail, *Hyallinia cellaria* (average size 6 m.m. across). A junvenile of these was also found at Omanu.

The conclusion is therefore reached, that, in spite of the great numbers of beach cottages which are being erected all along this coast, *Austrosuccinea archeyi* are fairly well established in the Omanu area.

Encouraged by these finds, a search was again made at Papamoa —the locality which had not yielded any specimens three years previously.

A thorough search was made for a distance of about a mile along the coast without any sign of their presence. I was on the point of giving up when I turned to a spot at the last hope.

It was on a high, commanding ridge, raised up between the beach and a low, flat, barren area of wind-swept sand. At this spot some 46 empty shells were found (again unbleached), varying in size from 5.25 m.m. to 11.50 m.m., averaging 8.50 m.m.; also there were 15 juvenile live specimens measuring from 3 m.m. to 5 m.m. These were all found within an area of approximately 4 sq. feet.

The sand-dune flora is very similar at both Omanu and Papamoa, being mainly lupins *(lupinus aborboreus),* Spinifex *(S. hirsutus),* the introduced Hare's Tail grass *(Lagurus ovatus),* and clumps of the tangled shrub *(Muehlenbeckia complexa).* Besides these there is at Papamoa the convolvulus *(Calytegia soldanella).*

The question is posed, whether or not *A. archeyi* is to be found along the Bay of Plenty Coast. A search was made of an area near Otamarakau—a place approximately half way between Mount Maunganui and Whakatane—but without success. However there is plenty of scope for searching in all the sand-dune areas which occur at intervals along the coast as far as East Cape.

I would record here that in January, 1954, opportunity was taken to search the sand-dunes at Matarangi—a beach which lies north of Mercury Bay, on the Coromandel Coast—but without success.

AT WHANGAMATA

by A. H. JONES

One bleached specimen of the interesting land snail *Austrosuccinea archeyi,* was found by the writer on the sand-dunes near Whangamata ocean beach in February, 1954.

As this appeared to be the first find from this locality; and, as time did not permit then to make a more detailed search, I suggested to Mr. W. Taylor of Whangamata (who is a member of the Section) that he make a further search of the same locality.

Mr. Taylor was successful in finding a number of dead specimens in the area. They occurred over a fairly extensive area, extending from Winifred Avenue on the south to Hunt Avenue on the northern side;

and were found on the sides of depressions among the sand dunes, mostly on the sunny side, and about two chains from the average high-tide mark.

The largest specimens found measured 21 m.m. and the smallest 5 m.m., mostly bleached, but a few retained the orange epidermis. This would indicate that some were alive at no very distant date, and raises the question, "has the colony entirely died out or is there likely to be a new family hatched, when conditions are favourable, from eggs deposited in the sand." No doubt Mr. Taylor will be able to supply the answer to this at a later date.

At the time of my visit in February the sand-dunes in this area were unfenced, and were covered mainly with the silvery sand-grass *(Spinifex hirsutus),* and a spiky semi-creeping plant *(Meuhlenbeckia complexa).*

It seems probable that this locality will be lost to collectors as the land is rapidly being roaded and developed for residential sites.

MT. MAUNGANUI

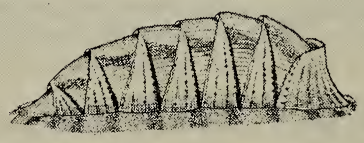
AMPHINUERA OR CHITONS

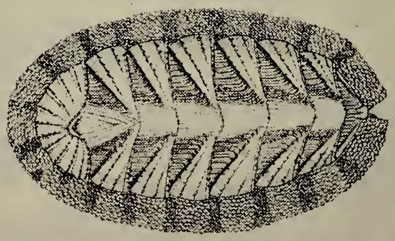
by GORDON WILLIAMS.

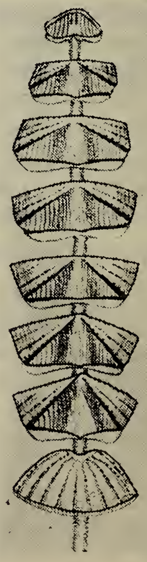
So many people come here with the one idea of collecting shells yet they omit the chitons, thus missing a group of mollusca intensely interesting, infinitely beautiful and requiring delicate handling to mount satisfactorily.

At first the beginner is apt to find it quite a problem to remove the valves and remount them in correct order so that all eight can be picked up at once and examined inside and out easily, at least the writer found it so and made a frightful mess of a simple operation.

Also the curing and mounting of the animal intact so that it assumes more or less its natural shape and appearance presents difficulties.







Here are a few hints on curing and mounting chitons which may be useful to the amateur.

Nearly all chitons inhabit intertidal rocks and as some of them cling like a limpet when touched care must be taken when removing not to injure them. Their natural instinct is to curl up into a tight ball as soon as removed and the use of force to straighten them tends to injure or even break the valves.

The best method is to place the chiton in a vessel of sea water as soon as possible and almost invariably they will soon straighten out and begin moving about. If you have a few strips of tin and some tape handy quickly transfer the chiton to the strip of tin, hold it flat with one hand and bind it down with the tape being careful not to bind too tightly as you may destroy the animal's natural shape. Put the chiton into a jar of spirit and leave it there till thoroughly cured, say a fortnight.

Next comes the mounting. When the binding has been removed place the chiton on an even surface and gently press the girdle down flat into its natural position and keep doing this during the drying process say three or four days.

If you can manage to do two at a time of more or less the same size place a bridge across their backs and put a weight on the bridge.

When thoroughly dry take a piece of stiff cardboard, smear glue over the entire under surface of the chiton, and weight it down, being careful to see that the girdle is firmly and evenly stuck and will not curl up.

To Remove Valves from a Live Chiton:

Place the chiton in a vessel, pour boiling water over it and leave till cold or cool enough to handle, then with a sharp pointed knife remove the valves, placing them in the correct order to dry. When ready take a pipe cleaner, white for preference and put a spot of glue on the extreme end, stick the posterior valve down in such a way that the slits are all visible, continue with the remaining valves in their correct order leaving a slight space between valves.

The advantage of the pipe cleaner is the fluff on it which holds the glue and prevents it smearing over the interior of the valves.

When completed all eight valves can be picked up at once and examined inside and out.

The three sketches have been made from a cured specimen and serve to illustrate this method of mounting.

List of chitons found by the writer at Mt. Maunganui and where to look for them:

The following are all to be found in the intertidal zone from Pilot Bay wharf to the harbour beacon.

Ischnochiton maorianus, very common
Notoplax violacea, common
Sypharochiton sinclari, common
Sypharochiton pelliserpentis, very common
Anthochiton aereus, common
Terenochiton inquinatus, rare
Lorica haurakiensis, very rare
Cryptoconchus porosus, common
Onithochiton neglectus, common
Amaurochiton glaucus, very common
Eudoxochiton nobilis, very common

Found on the Blowhole Rocks:
    Acanthochiton zelandicus, uncommon
    Guildingia obtecta, uncommon
Found inside a dead shell ocean beach:
    Anthochiton canaliculatus, very rare
Found on rocks, Motiti Island:
    Onithochiton mamoratus, common
Found on kelp root, Motiti Island:
    Craspedochiton rubiginosus, rare
Found in sand south of Salisbury Wharf:
    Notoplax cuneata, common

DREDGING AT KUAOTUNU

by D. STOCKER.

We are fortunate in being able to hire a power-driven boat here complete with owner who has a lifelong knowledge of these waters.

Mr. Stocker had the framework of our dredge made locally, and completed it himsellf. It is very simple, consisting of two flat strips of iron, 20in. long by 1½in. wide, joined at each end by short strips 8in. long and 1½in wide. 1½in. at the ends of these short pieces are bent at an angle of 30 degrees and bolted to the ends of the long strips to make rectangular jaws. The lower edges of the long strips are 5in. apart and the upper ones about 7¾in. The upper edges are bevelled off 30 degrees so that they will dig into the sea-bed. Iron rods, 1ft. long from each corner are joined by 4ft. long chains to a ring, to which is attached 100ft. of clothes line. This does not mean that we dredge in water of that depth as of course the dredge tows a long way behind the boat. From 15ft. to 30ft. depth is our average. The clothes line is a mistake for it is too thin and very hard on the operator's hands. Holes are punched at 1in. intervals in a row along the middle of each long strip, and to these are sewn an 8in wide band of sugarbag, or similar strong material, to which in turn is sewn about half an onion bag 20in. deep, but it could be less with advantage. We tried first with fine wire mesh, but it rusts too quickly for a dredge that is not used very often: also it holds too much sand. The onion bag is lighter, cheaper and easily renewable.

We had one try with a bucket dredge—just an ordinary galvanised bucket with the handle removed and a third loop welded on to carry the bridle of three short chains. Plenty of holes were punched in the bottom, though not enough as we soon discovered. The area scraped by such a dredge is very small, and owing to inadequate drainage the bucket filled with heavy sand. Incidentally there were no shells.

We have a light sieve, just a shallow box with a wire gauze bottom, and find it a great help. The contents of the dredge can be emptied into the sieve held over the side of the boat, and the surplus sand washed quickly and easily away without making a mess inboard. A canvas bucket or two completes our equipment.

Dredging fairly close inhsore to a flattish beach, with a rocky headland making a lee, seems best. The sea bed leading into a steep-to beach such as Ring's Beach we found very barren. There was naturally none of the small bottom growth there that harbours so much marine life. Our best hauls were made close in to Kuaotunu beach and off Matarangi Head where there is a very gradual slope. The shells most plentiful here, are *Myadora boltoni*, young *Pervicacia tristis*, young *Baryspira australis* and *Neoguralias sinclairi.* Off Maturangi Head the sea bottom seems to be composed of young *Zethalia zelandica,* but many minute species occur with them. The Zethalias made up at least half the bulk, all were juveniles about 4 m.m. and all alive. Off Matarangi we have got about 20 very small pinkish heart urchins, and also a number of swimming crabs. This day's dredging was done in Ferbruary, 1953.

Towards Whangapoua less interesting material is to be found; possibly the current at the harbour mouth is too strong, and the very dangerous Bar makes entry by small boat a needlessly risky undertaking.

To the amateur dredger, let me say this: If you strike a good patch it is better to drag up and down on it rather than to think, "If that one is so good there must be better further on." The chances are that there won't be, and you will find your earlier goldmine impossible to locate a second time.

TRAWLED SPECIMENS
FROM OFF TIMARU

by S. TRIGANCE.

AUGUST, 1954 produced, for me, two very pleasant surprises from a member of the Timaru fishing fleet. They were the Volute *Iredalina aurantia* Powell—two live specimens, the first seen from New Zeaalnd coastal waters.

One was a juvenile (this was shown at a recent meeting), the other, a fully adult specimen, complete in every detail. The specimens had a high glaze and looked as if they had been treated with a coat of clear varnish. The animals were bright orange in colour.

These shells were trawled at a depth of 90 fathoms due east of Timaru—the greatest depth so far trawled in this vicinity and this has been done only once to date.

From the same trawl I obtained a specimen of the sea-urchin *Goniocidaris umbraculum* in live condition—proof of its existence in this area.

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"OLD WINDOWS FOR NEW ONES"

by A. W. B. POWELL.

THOUSANDS of years ago, long before the western world had the luxury of glazed windows, the Chinese enjoyed an excellent alternative in the use of wooden latticed windows and doors "glazed" with the translucent shells of the bi-valve *Placuna placenta.*

This shellfish has a thin disc-shaped shell of semi-transparent mica-like quality ranging in size from four to six inches in diameter. One valve is perfectly flat and the other one slightly convex. It belongs to the family *Placunidae,* which has no New Zealand members but the family *Anomiidae,* which does occur in New Zealand, is closely related.

I had always imagined that these shell windows belonged to the dim past, eclipsed and almost forgotten since the advent of window glass.

Disillusionment came when I visited the Phillipines last November and found shell windows neither forgotten nor persisting as relics of the past but flourishing as a modern industry.

Almost every house from the mean to the pretentious has its shell windows and very attractive they look. In use they have proved most efficient and durable.

The flat, circular shells are cut into tiny panes of 2½ inches in diameter and are slotted into the latticed frames of Phillipine mahogany.

The advantages of the shell windows over glass are several. They admit a soft, mellow light excluding the full glare of the tropical sun and have a very low ultra-violet ray transmission. They are translucent but not transparent so curtains and blinds are unnecessary. They are extremely strong and durable and have proved the most satisfactory material for surviving the dreaded typhoons.

Houses may be wrecked by a typhoon, but almost invariably the windows are retrieved intact and incorporated in a new structure. The use of glass under such conditions would create an unnecessary hazard.

Some idea of the extent of the Philippine window pane industry is given by the fact that in Manila alone seven million window pane oysters are used annually in house construction. In addition vast quantities are used for shell craft products which range from lampshades and fire screens to trays and trinkets for the tourist trade.

Now for something about the mode of occurrence, propagation, gathering and marketing of these useful shellfish .

The "Kapis," which is the Filipino name for the *Placuna,* occurs naturally in great abundance on grey mud in shallow bays and estuaries. The larval stages are free floating and they begin their sedentary habits as soon as the shell develops. The young reach a diameter of 55 to 77 millimetres at the end of the first year, 133 millimetres (5¼ inches) at the end of the second year and reach sexual maturity in the third year

A number of localities in the very extensive Manila Bay are well suited for growing the kapis and many fishermen are employed in farming this shellfish. The beds are contained by well constructed bamboo fences and so rapid is the growth of the shellfish that juveniles planted in October and November may be harvested in April or June of the following year.

The seedling kapis are gathered from natural beds when they are 30 to 40 millimetres in diameter and are sold to the shell farmers at the rate of from 7/- to 8/- per 10,000.

When the adult shells are harvested the meat is removed and the shells soaked in water after which they are individually scrubbed to remove dirt and discolouration.

Only the flat valve is used for windows and these after they have been cleaned, graded and packed into plaited bamboo baskets have a market value of about £15 per 10,000 shells.

Nothing that can serve as food is wasted by the Filipinos, not even the wafer thin animal of the *Placuna* which is by the addition of evaporated milk, flour and pork lard, commonly served as an omelette. Some of their recipes for kapis meat do not sound nearly so appetising. One is a paste which is prepared by adding one part of salt to three parts of kapis meat. The mixture is then allowed to ferment and after several months the paste is ready to be eaten. The liquid which develops during fermentation is carefully siphoned out and bottled for use in flavouring food preparations.

Incidentally I didn't find out all this until I had partaken of quite a number of Filipino dishes.

I was determined to acquire a Filipino shell window as a souvenir of my visit but found that they all seemed too large to be accommodated in an ordinary suit case.

On mentioning my dilemma to a group of congress delegates a young Filipino girl student came to my rescue. She invited me to lunch next day at her home and promised that the requisite sized window would then be presented to me.

I put in an appearance the next day and found the family most charming. A gargantuan meal was prepared in my honour, of no less than twenty courses. These I did full justice to and probably made a grave social error in partaking of all courses instead of confining myself to three or four delicacies.

It is little wonder that the purpose of my visit was temporarily forgotten until I was reminded of it by noticing the daughter of the house leaving the premises and as I correctly surmised in search of my window.

I intercepted her and explained that I only desired to know where I could go to get one of the windows. She replied that none but herself could go on this particular errand. Enlightenment came to me some days later when I found that windows of such dimensions were made expressly for what may be termed the smallest room in a house.

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SOME NOTES OF INTEREST

by H. E. WHITTEN.

1. LEPSIELLA SCOBINA RUTILA (SUTER)

THIS interesting subspecies was found, last January to be quite common near Mullett Point, Mahurangi Peninsula. A number of specimens were taken from the eastern end of Goldworthy's Bay, and also on the point between that bay and Scandrett's Bay. They were found living on the rocks throughout the intertidal zone in association with the more plentiful *scobina scobina* (Quoy and Gaimard. The association of the two subspecies would suggest that they are not merely ecological varianta. This is confirmed by Mr R. L. Matthew's observations at the nearby Kawau Island (Bulletin No. 6, 1950. p. 17).

2. SOME INTERESTING LAND SNAILS

Allodiscus granum (Pfeiffer):

Examining some specimens of this snail which were found recently near Glen Massey in the Ngaruawahia district, the writer was surprised to discover one which has a number of bristly hairs projecting from it. These hairs are very short—about one-tenth millimetre in length, dark in colour, and are not arranged in any regular way. They are apparent on all the post-nuclear whorls, but are more plentiful on the body-whorl. None of the other specimens examined show any trace of these hairs.

Phenacohelix chordata (Pfeiffer) :

This was stated by Suter to be "a rare species." This was probably an exaggeration. However, it does not appear to be a very common snail, although it has been found in several widely separated localities throughout the Dominion. During the past year I have taken a few specimens from each of two well separated areas. I found the species first of all on the ridge between the Te Mata and the Waikawau valleys on the Coromandel Peninsula, and then later beside the road running along the ridge between Huia and Whatipu.

Phenacohelix ponsonbyi (Suter):

In a remnant of bush clothing a narrow gulley near the Te Mata stream (Coramandel Peninsula), I recently obtained several specimens of an albino form of this well-know northern snail. They were living inside the bases of Nikau fronds which were still attached to trunk of the palms. These specimens appear to be identical with the typical form except for their uniformly white colour, without any trace of pattern at all. The usual form was also plentiful in the same locality.

Flammulina cornea (Hutton) :

In last year's Bulletin, Mr. A. E. Brookes recorded finding this species at Port Fitzroy, Great Barrier Island. In May, 1953, I obtained a specimen from the ridge between the Te Moto and Waikawau valleys. This is not an entirely new record for this area, as Mr. J. Adams, in a paper contributed to the Transactions of the N.Z. Institute, vol. XIX (1886) included it in his list of Land Mollusca from the Thames Goldfields. For some reason or other, Suter in the "Manual" omitted this locality, giving only the type locality, "Auckland." The ridge from which my specimen comes is only a few miles north of Thames.

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A VARIATION

IN THE LAND SNAIL SUTERIA IDE (GRAY)

by N. GARDNER.

THE solitary species of this genus which is very common over most of the North Island shows remarkable constancy in shape and sculpture of shell. Because of this, specimens once determined as Suteria are quickly passed over by collectors in the quest of the more elusive species. However, they are really worthy of more intensive study, as variations, at least in sculpture, do occur, though such variations are not so apparent until a fair series of shells from widespread localities are brought together.

One such divergent form occurs at and around Mt. Honokawa in Raukumara Range directly inland from Ruatoria. Though of average size and proportions the sculpture is noticeably different there being a far greater number of axial riblets present. Whereas species examined from around Auckland average 47 axials in the body whorls, those from 2000 feet on Mt. Honokawa possess 64. These axial ribs which are crossed spirals (of greater relative strength than is usual) cut up the surface of the shell into rather even, close, tiny squares. In the normal local population this reticulation of ribs results in a rather uneven oblong pattern with spirals at times very weak.

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COLLECTING AT GREAT BARRIER ISLAND

by P. WARREN.

THE Great Barrier is a large island situated north-east of Auckland and is one of the many places named by Captain Cook during his first visit to New Zealand. The present population numbers about 200, most of whom are farmers, others work for the State Forest or Public Works, while a few more are commercial fisherman.

There is a weekly boat from Auckland, carrying supplies and passengers or one can charter a plane to the island's one aerodrome. Roads are few, and very rough, so transportation is not too easy over there

The Island has long been recognised as a good collecting area, and some notable discoveries have been made there. During the early years of the present century an expedition did dredging in 100 fathoms off the east coast of the island, any many new shells were described by Murdoch, Suter and Webster. This area is the type locality of such interesting gastropods as *Paracomitas augusta, Vexitomina optabilis, Iredalula alticinta, Diala subcarinata, Uberella barrierensis,* to name just a few.

To the east of the main island is Rakitu or Arid Island, a small island of some 600 acres, of a curious limetone formation. Here I have found *Nassarius aoteanus* and *Nassarius particeps. Cominella virgata* from this area has a vidid orange aperture, and in reminiscent of the more northern sub-species *brookesi* in general appearance. In the little bay there are very good specimens of *Cellana radians and stellifera.*

Opposite, on the main island is an ocean beach named Whangapoua, where *Phillipia lutea* and *Ellatrivia mamorata* have been found. Also a bi-valve which appears to be *Amphidesma ventricosum* from the descriptions I've had, though I have not actually seen the shells. I have taken very fine *Cantharidus opalus* from this beach.

Further south is a very long beach called Kaitoke, where the aerodrome is located. *Janthina globosa* and *exigua* wash ashore here at times: other species worthy of note are the very fine *Tonna haurakiensis* and *Argonauta nodosa.* When the steamer Wiltshire was wrecked on the island in 1922, there were a number of hogsheads of whisky washed ashore on this beach, so there were others besides collectors who were interested in washups at that time! On a rocky outcrop at the north end of the beach, I have taken *Rissoina zonata, Mayena australasia, Monoplex australasiae, Rostanga rubicunda* and one *Nassarius aoteanus.*

South of Kaitoki is Oruawharo, sometimes known at Medland's Beach. *Venus osbornei* can occsaionaly be picked up here, in fact the type locality is not far away from there. Other members of the *Venustas* genus found at Oruawharo includes *tigris, pellucida spirata and punctulata. Lima sydneyensis* and *Xenophalium labiatum* are two rarities sometimes found here, other shells I have collected include *Cylichnina striata, Modelia granosa (alive), Mayena australasia, Charonia capax,* and very fine *Cominella quoyana.* In a creek were very nice *Melanopsis trifasciata* and *Potomapyrgus zelandiae,* well up in the fresh water were *Melarhaphe oliveri.* My brother-in-law has a farm on the flats, and in a swamp on his property I found lots of *Planorbis corinna.*

Between Oruawharo and Tryphena is a ridge which is the type locality of *Schizoglossa novozelandica barrierensis.* This subspecies is very elusive but there is no mistaking it if one is lucky enough to find it. I found a juvenile on the beach at Okupu Bay, it had evidently been washed down the creek from some nearby bush, but unfortunately I did not have time to make a thorough search of that area. Not much is known of the land fauna of the island, generally but no doubt intensive collecting would be well repaid in material, as there are hundreds of acres of heavy bush. It is to be regretted that wild pigs are abundant; not only do they cause havoc to the fauna, but also to the nerves of the explorer.

The west coast of the island has many harbours and inlets, and some good collecting may be had in these places. At Tryphena and Whangaparapara *Agnewia tritoniformis* has been found, and the rare

Hydatina physis has been recorded from Tryphena. Dredging has yielded some excellent material from some parts, papers by Mr Powell describe many of the species. Some of the fine material I have seen includes *Buccinulum fuscozonatum, Poireiria zelandica, Coluzea spiralis,* and *Zeacolpus pagodus.*

At Port Fitzroy I have found very good *Venustas tigris* and *Xenophalium pyrum,* also *Monia zelandica, Mytilus planulatus, Murexsul octogonus,* and very pretty *Chlamys zealandiae.* Nearby Nagle Cove is a good place to collect the *Xenophalium pyrum* form with 3 rows of nodules instead of 2; here one can find live *Tonna haurakiensis* in the sand at low water and *Venustas pellucida* in the kelp. *Chlamys zeelandona* is not uncommon under stones.

A little to the north is a large open bay called Katherine Bay where the chief Maori settlement is. This can often be a good place for washups—*Alcithoe* often comes ashore alive—and if one is lucky enough, *Xenophalium labiatum* may be found. On the land *Placostylus* used to be living, having no doubt be transported there from the mainland by the early Maori tribes, but the snails appear to have been wiped out by fires now. One or two small colonies are believed to be still in existence in other parts of the Barrier, but I have no up-to-date news of them, so they may be extinct too.

Near Katherine Bay is Miner's Head where copper was mined in the middle of last century. From a boat one can see green stains on the rocky cliffs, though the copper is not present in large quantities. There has been talk of mining there again, but I doubt if it will come to pass. The steamer "Wairarapa" was wrecked below the cliffs at Miner's Head in October, 1894, with the loss of 121 lives—one of the worst shipping disasters New Zealand has had. From here one can see at the very northern end of the island, a curious group of rocks which we call the Needles. Long and slender, they stick straight up from a submerged reef where there is always a very strong tide rip. They were named the Aiguilles by D'urville during the French expedition which has perpetuated the names of Quoy and Gaimard in New Zeaalnd conchology. At this part of the island there are no beaches, just cliffs all the way, but I should think one could do good work with a dredge up there.

Near Port Fitzroy are large *rock oyster* beds where picking is carried out annually by the Marine Department. The animals are large and succulent and dead shells furnish excellent specimens for the collector. I remember one place where the oyster rocks gave way to soft papa rock at low tide. Here were good examples of *Arca novozelandiae* and the largest specimens of *Anchomasa similis* that I've ever seen. Unforunately I wasn't a shell collector at the time, so never took any!

On an offshore island is a large Gannet rookery, a wonderful place to visit in January when the whole life cycle may be seen, from the eggs to the adult bird. The mother birds are very ferocious, and a peck from their large beaks is something to be avoided. The birds always waddle to the edge of the cliff and swoop into the air like a glider as they cannot fly straight up off the ground. On another island are some wild deer, and on a third the North Island Weka has been liberated to breed as it's becoming so rare on the mainland. My father was there recently and saw and heard quite a lot of them. We hope they will continue to thrive there.

All in all the Barrier is full of interest, and though I would hate to have to go back there to live, I'm always glad to go back to visit the place, and do whatever collecting is possible.

Hulme, Syd., 152 New North Road, Eden Terrace, C.3.	1, 3.
James, Miss P., 31 Riversdale Road, Avondale, S.W.3.	1 to 5.
Jeakings, W. G., 119 Leinster Road, Merivale, Christchurch.	1 to 4.
Johnston, W. H., Seddonville, Buller.	1, 3.
Johnston, Mrs. J. B., 56 Marine Parade, Herne Bay.	
Keddell, Miss K., 76 Grafton Road, Auckland.	1, 3.
Kirk, Miss H., 16 Newman Street, Timaru.	
Lowry, David, 92 Peachgrove Road, Claudelands, Hamilton.	1, 2, 3.
Lee Pike, W., 37 Wiremu Street, Balmoral, S.2.	1, 3.
Lowe, Mrs. G. E., P.O. Box 65, Havelock North, H.B.	
McMillan, John, 8 Queen's Parade, Devonport, N.1.	1, 3.
Matsen, Mrs. L., 11 Bardia Street, Belmont, Takapuna, N.2.	1 to 4.
Mitchell, Miss D., P.O. Huiroa, Stratford, Taranaki	1.
Moore, Mrs. F. W. 97, Richmond Street, Thames.	1 to 4.
Mouat, Mrs. G. Snr., Glenfield Road, Birkenhead,	
McFarlane, S., 64b Shore Road, Remuera, S.E.2.	1, 3.
McKellow, Mrs. M. E., 42 Riversdale Road, Avondale, S.W.3.	1 to 5.
McMeekin, H. B., 2 Milliken Road, Mt. Roskill, S.3.	1, 3.
McPherson, E., Churchcill Park, 320 Riddell Road, Glendowie, E.1.	1 to 5.
Moyes, H. A., P.O. Box 52, Whitianga, Mercury Bay	
Nevill, Mrs. G. F., R.M.D., Port Charles, Coromandel.	1, 3.
Paul, W. J., 6 Monaghan Avenue, Karori, Wellington.	1 to 4.
Peterson, A. R., 8 Derry Street Green Lane, S.E.4.	1, 3.
Philip, Mrs. D. J., 43 Earlsworth Street, Mangere East, S.E.7.	
Quirk, T., 65 Waitangi Road, Onehunga, S.E.5.	1 to 5.
Ramsay, Mrs. A. Hillcrest Road, Hamilton.	1 to 5.
Rickard, Miss V., c/o. Huia Store, Huia, Auckland.	1, 3.
Richardson, Arthur, Great South Road, Papakura.	1 to 5.
Richardson, E. S., Oruaiti School, Mangonui R.M.D.	1 to 5.
Riley, Miss E. A,, 56 Marine Parade, Herne Bay.	
Roberts, R. V., 105 Sefton Street, Wellington.	1, 3.
Robson, Mrs. H., Comber Street, Matamata.	1to 4.
Rosenbaum, Dr. J. E., 292 Jervois Road, Ponsonby, W.1.	1, 3.
Short, F. G., Furniss Road, Ruawaro R. D. Huntly.	1 to 5.
Smith, Mrs.. C., P.O. Box 39, Half Moon Bay, Stewart Island.	1, 3.
Smith, F. J., 16 Hutton Street, Otahuhu, S.E.7.	1 to 4.
Simmons, Judy, "Harp Hardware," Gt. South Road, Auckland	1, 3.
Stocker, Mrs. V., Kuaotunu, R.M.D., Whitianga.	1, 2.
Swinbourn, Miss J. A., c/o. Dept. of Agriculture, P.O. Box 2298, Wel.	1, 3.
Taylor, W., c/o. P.O. Whangamata.	1, 3.
Thomson, Mrs. W. P., 15, Hillsborough Road, Onehunga, S.E.5.	1 to 5.
Thompson, K., Huia Dam, Auckland.	1 to 5.
Trigance, Mrs. Ron., Ormsby Street, Temuka, S. Canterbury.	1, 3.
Voss, A. S. McLaren's Falls Power Station, Lower Kaimai, R.M.D., Tauranga.	1, 2.
Warren, T. P., P.O. Box 2, Leigh.	1, 2.
Watene, Miss B. Phyllis, Waihou Bay, via Opotiki.	1, 3.
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BULLETIN No. 11

AUCKLAND, NEW ZEALAND

NOVEMBER, 1955

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CONCHOLOGY SECTION, AUCKLAND MUSEUM
BULLETIN No. 11

EDITORIAL.

WE PRESENT our modest Annual Bulletin,, and trust that it will again be received with approval, both here in our land and overseas.

All the articles in this publication were contributed by members, and we feel sure you will enjoy reading the results of their independent research and field work. In a country comparatively recently settled such as New Zealand, there is considerable scope for such observations.

Members have again this year shown keen interest in the Section's activities. Our meetings have been very well attended, while the organised field days appear to have had greater attraction than previously, particularly to younger members. We have also gained a number of new members.

For the Section, the year 1955 has been a very sound and satisfactory one. To all who have contributed to this issue, directly or indirectly, we tender our thanks.

E. N. & N. W. GARDNER,
1st November, 1955.

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INTRODUCED LAND MOLLUSCS OF NEW ZEALAND.

By H. E. WHITTEN.

THE introduced land molluscs of our country form a small but interesting group which has been largely neglected except by gardeners intent on the destruction of the more obvious snails and slugs. Little detailed study has been done on their distribution and relative abundance in different districts and consequently our knowledge of them is very meagre.

The first attempt to publish a list of these introduced species was by C. T. Musson (1890). Musson's list was revised by Henry Suter in two papers (1891, 1895) and again in the *Manual* (1913). The next list was published by G. M. Thompson (1922) who based his notes mainly upon information supplied to him by Suter in 1917. Since then the only paper dealing with the group, as far as I am aware, is that of H. E. Quick (1952). Unfortunately this latter paper adds nothing to our knowledge of the group, for the author's sole authority, as far as New Zealand is concerned, is Musson's paper of 1890.

This present article has the following as its aims:—

(a) To attempt a provisional revision of earlier lists.

(b) To bring the nomenclature up-to-date.

(c) To give additional locality records and some notes on the species.

(d) To stimulate, if possible, a greater interest in this group in the hope that additional information may be forthcoming which will help give a more accurate picture of the distribution of the various species throughout the country.

Species to be deleted from Suter's list:

The following species have almost certainly failed to establish themselves and should, on present evidence, not be included among our introduced molluscs.

Helicostyla tricolor Pfeiffer.
Helicostyla daphnis Broderip.
Helicostyla fulgetrum (Broderip).

These species are native to the Philippine Islands and it is extremely unlikely that the records of their occurrence in this country are of live specimens.

Aneitea graffei Humbert.

This is an Australian slug which has not been reported here since the two occasions cited by Suter.

Doubtful species:

Two other species should be considered, at present, as being very doubtfully established. Unless more conclusive evidence for their occurrence comes to hand they will probably have to be omitted from the list. *Note:* In the following the current name is used for all species. Where this differs from that used by Suter the name given in the "Manual" is given in square brackets after the current name.

Vitrea crystallina (Muller). [*Hyalinia crystallina.*]

Recorded by Suter from Auckland, it has not been seen in recent years. This species, is, however, of small size (c. 3m.m. in diam.), and as there is a very close superficial resemblance between many of the Zonitidae, this species could be mistaken for a juvenile of another species unless carefully examined.

Cepaea hortensis (Muller). [*Helix hortensis*].

Though stated by Thompson to be "apparently widespread in the North Island," with Auckland, Taranaki an Napier given as localities, it is doubtful if it does occur in the country.

Species to be retained:

Family TESTACELLIDAE.

Testacella maugei Ferussac.

This is a dark brown "shell-slug" which, unlike most slugs, is stoutest near the tail. The shell is ear-shaped and is found under the surface at the tail of the animal.

Vicinity of Auckland (Suter); Ashburton (W. W. Smith). "Only seen in Professor Thomas's garden, Mt. Eden." (R. K. Dell).

Note: Names in brackets after a locality refer to records cited in Thompson (1922).

Family PYRAMIDULIDAE.

Vallonia excentrica Sterki.

A very small snail. It has a flattish greyish-white shell which measures about 3 m.m. in diameter. There is a rather wide umbilicus and a thickened, expanded lip. Sculpture consists of fine curved radial riblets.

Albert Park, Auckland (Cheeseman); Taranaki (W. W. Smith); near Leigh, A. W. B. Powell; Whitford, Auckland, R. K. Dell, c. 1937; Nelson, E. S. Gourlay, 20-2-1939; Tahunanui, Nelson, R. A. Cumber, April, 1952.

Last year (1954) N. W. Gardner found large numbers of snails living in leaf mould on the roof of a shed covered with a flowering creeper at Devonport. These snails appear to be nearer *V. costata* (Muller, than to *excentrica,* but may be only a form of the latter.

Family STENOGYRIDAE.

Ceciliodes acicula (Muller). [*Caecilianella acicula*].

A subterranean shell, normally found from a few inches to about three feet below the surface of the ground. The shell is about 5 m.m. in height, cylindrical in shape and is "of ivory-whiteness, thin and transparent with an iridescent gloss."

Auckland (Suter). "Only seen from gardens at Epsom, Auckland," R. K. Dell; Epsom Showgrounds, W. La Roche; Mt. Eden, A. E. Brookes; Mt. Albert, A. E. Brookes.

Cochlicopa lubrica (Muller). [*Cionella lubrica*].

A small snail with a pale yellow-brown, transparent and very glossy shell. In shape it looks rather like a minute Placostylus. It is found up to about 6m.m. in height. It is very common around Auckland and in parts of Northland.

Kaitaia: L. Price, 1955; Whangarei: R. K. Dell, 1938; Mrs. G. Worthy, 1955; Devonport: N. W. Gardner; Takapuna: R. K. Dell, 1938; Mt. Eden: N. W. Gardner; Avondale: H. E. W., 1954; Titirangi: A. K. Hopkins; Auckland Domain, on steps of the Museum after rain, A. W. B. Powell; New Plymouth: R. K. Dell, 1838; Miss D. Barnitt, 1946; Henderson: G. W. Gardner, 1955.

Family ARIONIDAE.

Slugs with no real shell but with a few disconnected grains of shelly material beneath the rear part of the mantle. Suter listed four species of *Arion* among our introduced fauna. A regrettable absence of any definite information which would supplement the earlier records leaves the present distribution of these slugs very obscure.

Arion ater Linnaeus. [*Arion empiricorum Ferussac.*]

A large slug which grows to about 120 m.m. in length. It is very variable in colour. The upper surface is covered with coarse tubercles. The back is not keeled.

Near Auckland, and Dunedin (Suter). I have found what I take to be this species under stones and timber on the ground around Auckland.

Arion subfuscus Draparnaud.

Smaller and more cylindrical than *A. ater.* Light reddish-brown in colour, with faint black bands on the sides. The back is slightly keeled behind.

Dunedin (Hutton).

Arion hortensis Ferussac.

A smallish slug growing no longer than 40 m.m. It is very variable in colour but may be distinguished from young specimens of *A. ater* in being relatively more slender and in being usually striped longtiudinally on the back. There is no keel. Recorded by Musson as being plentiful at Auckland. Taranaki (W. W. Smith). This species is very common throughout the Auckland district.

Arion minimus Simroth.

Recorded from Rangitoto (Suter); Matahiwi, near Masterton (Mrs. Longstaff). Recently on a visit to Rangitoto (1st October, 1955), I found several specimens of a very small *Arion* near "the tanks." These were under stones and wood. Whether or not they were specimens of *minimus* I could not say, as I am not sure of the description of this species. They looked very much like a small *A. hortensis,* but none of them were more than about 12 m.m. in length. In a survey of the land mollusca of Rangitoto a few years ago, Mr. and Mrs. N. W. Gardner found no introduced molluscs on the island except a *Limax* species. This was "found in a few localities, i.e. near Islington, The Wrecks, Rangitoto Wharf, and Black Rocks. It was by no means plentiful."

Family HELICIDAE.

Helicella caperata (Montagu).

This snail has a rather solid shell, subconical in shape, and with a rather wide and deep umbilicus. It is whitish to pale fawn in colour, usually with a brown spiral band encircling the whorls. There may, however, be considerable variation in colour and markings. Prominent ridge-like growth striae give the surface a wrinkled appearance. It is about 8m.m. in diameter and is found normally at roots of grass and under stones, etc., in sandy soils.

Waikawau, Thames Coast, under wood and old sacks in damp situations, Mrs. F. E. Moore; Rukakapatuna, Martinborough, J. C. Yaldwyn, 3-3-1952; near Gladstone, Wairarapa, P. C. Bull, July, 1953; common on limestone country; Ward Island, Wellington Harbour, R. A. Falla, 25-7-1953; "Very common in gardens on sandy soil and on the sand dunes, Lyall Bay, etc., near Wellington, Paekakariki, Paraparaumu, Waikanae," R. K. Dell; Seatoun, Wellington: Mrs. G. Worthy; Nelson (Suter).

Helix aspersa Muller.

This species is widespread and in places very abundant. Except in bushclad areas there are few districts into which this snail has not penetrated. Thompson quotes Suter as stating that it was (1917) more abundant in the north than it was at Christchurch and further south. This is probobly still the case. Mrs. C. Smith, of Half Moon Bay, Stewart Island, in a letter, has informed me: "I have not come across any such [introduced] snails on the Island. The nearest locality . . . is Invercargill, where an odd *Helix aspersa* turns up. It is rare enough, so far as I know, to be looked upon as a curiosity and sent over to me."

A few North Island districts are apparently as yet free of this snail. Mr. N. W. Gardner reports that it is not yet to be found around Taumarunui. Although frequently found near the edges of native bush, it is not very far within the bush. At Spirits Bay I have found it living under flax buhses in company with *Placostylus* snails and *Rhytida duplicata vivens* near Pandora and at Kapo Wairua.

H. aspersa is a very variable species, and in any community several forms of shell can usually be found. Mr. R. K. Dell has informed me that at the Dominion Museum they have a small collection of peculiar forms from Wellington—sinistral, turriculate and with detached whorls.

Mr. Powell has noticed that an interesting form is developing in some of the sand dune areas of Northland, especially behind Tokerau Beach, Doubtless Bay. There the prevailing form is light coloured. This is so with both animal and shell. It would seem to be an interesting example of natural selection at work developing a colour form which will give the greatest protection from natural enemies in that environment.

Family ZONITIDAE.

Oxychilus alliarius (Muller). [*Hyalinia alliaria.*]

This snail has a shell of about 6 m.m. in diameter and which resembles that of a half grown *O. cellarius,* except that the body whorl is shallower. The animal is blackish and not slate-coloured as is that of *cellarius.* The shell is glossy, darker above than below and it has a broad umbilicus. It does not seem to be common in our country

"In conservatories and hothouses" (Suter). Pukekura Park, New Plymouth, A. W. B. Powell.

Oxychilus cellarius. (Muller). [*Hyalinia cellaria*].

Grows to about twice the size of *alliarius.* The shell is flat, thin, glossy, and rather transparent. It is yellowish above and whitish beneath, sometimes with a greenish tinge. The umbilicus is moderately wide and deep. This is the most plentiful and widespread of the introduced snails with the exception of *Helix aspersa.* It occurs in many parts of the North Island, e.g., Whangarei, Dargaville, Auckland, Thames, Tauranga, Napier, Gisborne, Wanganui and Wellington. In the South Island it is found at Christchurch. It is a very common snail around Auckland. At Te Mata, Thames Coast, I have found it sheltering under the fern *Doodia media* R. Br. in company with *Rhytida greenwoodi* (Gray).

Family MILACIDAE.

Slugs of this family and of the related *Limacidae* possess a thin shell which is located beneath the mantle. They may be distinguished at sight from those of the *Arionidae* in that the sinus in the mantle is nearer the rear than the front, whereas in the *Arionidae* the sinus is nearer the front of the mantle. The comments on the lack of information as to the distribution of the *Arionidae* apply also to the slugs of these two families.

Milax gagates (Draparnaud). [*Amalia gagates.*]

A smallish slug, 40-60 m.m. long, very variable in colour. There is a prominent keel running from the mantle to the tail. The shell is small, oval and iridescent. Auckland, Ohaupo, Hawkes Bay (Thompson). I have found this slug at Warkworth, Avondale and Thames. It is probably not uncommon in the Auckland province.

Note: Suter states that this species is very variable and that quite a number of varieties can be distinguished. He names three species included in the *gagates* group as occurring in New Zealand. No localities are given for these. It would seem that further information is necessary before they can be included in our introduced fauna.

Family LIMACIDAE.

Agriolimax laevis (Muller).

"An active, glossy, little dark-brown creature, with a paler mantle." It grows up to about 15 m.m. in length. The shell is shaped rather like a finger nail. It is said that if the animal is touched when crawling it arches its back like some caterpillers. Suter gives no localities for this slug. Thompson simply states: "It appears to be common in New Zealand."

Agriolimax arestes (Linnaeus).

Variable in colour, but usually ash-grey touched with brown. Covered with distinct tubercles when at rest. The back is keeled towards the tail. The shell is thin, oval, concave beneath and almost flat above.

"Common in meadows, fields and gardens" (Suter). "Auckland, Wellington, Taranaki, Nelson, Greymouth, Christchurch, Dunedin, etc." (Thompson).

Limax maximus (Linnaeus).

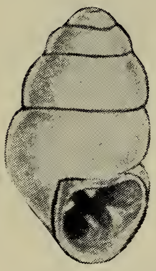
The largest of our introduced slugs. Found up to about 150 m.m. in length. The colour varies, the surface is much wrinkled, and there is a slight keel towards the tail. The shell is oblong, somewhat convex above, flattish or very slightly concave below.

Dunedin, Taranaki (Thompson). Mr. Powell states that it is not uncommon around Auckland, especially in the Papakura and Manurewa districts.

Limax flavus (Linnaeus).

A yellowish slug with white and black spots giving it a tesselated effect. The foot is white margined with yellow. The back is keeled towards the tail. The shell is oblong, somewhat concave beneath. Thompson states: "This species is rather common now and has been reported from Dunedin, Greymouth and Taranaki."

INTERESTING RECENT DISCOVERIES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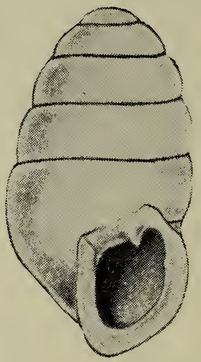
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Pupilla muscorom (Muller). Fig. 2.

This is a small snail with a glossy yellowish - brown shell, about 3 m.m. in length and cylindrical in shape. It has been found living at Thames by Mrs. F. E. Moore, who in a letter states: "They were found on Mt. Pleasant under a board, amongst vegetation, in March, 1944. They were fairly plentiful at the time, but went away and have never returned." Recently (April, 1955) Mr. E. N. Milligan collected a dead shell of this same species at Western Springs, Auckland. Until further living colonies of this snail are found it must remain on the doubtful list.

Vertigo (?) sp. Fig 1.

In March of this year Mr. A. K. Hipkins discovered a tiny shell of a land snail in some shell sand collected at McGregor's Bay, Whangarei. This, in all probability, had been washed down by a stream nearby. It is thus probable that living specimens may occur somewhere in the neighbourhood. The shell is only 1.6 m.m. in height. The figure shows the features of the shell, with the arrangement of the teeth within the aperture. It seems to be a species of *Vertigo,* possibly *V. pygmaea* Draparnaud.

These discoveries open up interesting possibilities. Both the above snails are small and consequently could be easily overlooked. The habitat of both, amongst the roots of pasture plants or in crevices of rocks, is such that they would not be found where land snail collectors would normally be searching. Thus both of these snails could be established in the country with colonies not yet discovered.

Mr. Powell and Mr. Dell have, from time, to time, seen other living land molluscs in the country. These have been intercepted by the Agriculture Department on fruits and plants coming into the country. These have been mainly Australian, American or Pacific Islands slugs and snails.

Acknowledgements:

The above notes have been based but little upon my own personal observations The information contained therein has been based mainly upon information kindly and generously supplied by the following, to whom I would express by thanks: Messrs. R. K. Dell, A. W. B. Powell, N. W. Gardner, A. K. Hipkins and E. N. Milligan; Mesdames G. Worthy, F. E. Moore and C. Smith. Special thanks are due to Mr. A K. Hipkins, who drew the illustrations.

Literature:

Musson, C. T. 1890 : 'The Naturalised Forms of Land and Fresh Water Mollusca of Australasia." Proc. Linn. Coc. N.S.W. Vol. V. (Series 2nd), pps. 883-896.

Suter, H. 1891: "List of the Introduced Land and Fresh Water Mollusca of New Zealand." Trans. N.Z. Inst. Vol. XXIV, pps. 279-281.
1895: "Additions to the List of Introduced Mollusca." Trans. N.Z Inst. Vol. XXVIII, p. 323.
1913: "Manual of the New Zealand Mollusca." Wellington, Pps. 1071-1073.

Thompson, G. M. 1922: "The Naturalisation of Animals and Plants in New Zealand." London, pps. 258-264.

Gardner, N. W. and E. N.: "The Native Land Snails of Rangitoto Island." Auckland Museum Conchology Club Bulletin No. 5.

Moore M. "How I Discovered *Helicella Caperata.*" Auckland Museum Conchology Club Bulletin No. 5.

Quick, H. E. 1952: "Emigrant British Snails." Proc. Mal. Soc. (London), Vol. XXIX, part 5.

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COLLECTING ON OFFSHORE ISLANDS.

By E. W. MILLIGAN.

OFFSHORE islands have a particular interest to the collector due to certain characteristics:—

1. These islands are not readily accessible to the collector so that there is a good opportunity for finding rare local species.

2. The island is an entire unit for study, thus eliminating the need for defining boundaries and the possibility of encroachment on boundaries of previous chroniclers.

3. The islands, particularly small ones, have special climatic, ecological and physiographic features which affect the organisms one wishes to study. This is the case with land molluscs, where humidity and precipitation are special features in island habitats. Marine faunas tend to be little different from peninsulas, though peculiar currents may prevail

4. Problems of distribution. That is: how and from where did the island get its population. Due to the susceptibility of land snails to change in environment, this is an interesting problem in this respect.

Mayor Island, some 28 miles north of Tauranga, must be visited by arrangement with the Mayor Island Board of Trustees, Rotorua. The landing spot is at Opo Bay, one of the three beautiful sandy beaches, including Omapu, just a few hundred yards to the west over a narrow peninsula, and Oira (N.W. Bay), about two miles away. Opo Bay was a very beautiful spot, sheltered, with the beach a few yards away from the camp site, ringed by flowering pohutukawas and flanked by bush-clad hills leading to the crater.

The crater is a most fascinating place, much like a pot in structure, as it is ringed by vertical cliffs. The narrow rim then drops in places an equal distance to the sea. Access is by climbing off a brink of rock into a pohutukawa with a 300ft. drop on either side The land mollusc population should prove interesting, as a limited search revealed a new species of *Flamulina* and a variation of *Allodiscus dimorphus* in the crater. The normal *A. dimorphus* is found near Opo Bay, so that it appears speciation is taking place in the crater.

Though the visit was in the "right' season, November, only one nautilus over 2ins. was found. Interesting items included two squids—*Notodorus sloanii* and a high tide pool alga, *Microdoctyon,* a short turf-like netted green seaweed, which yielded 24 species. Some of these are recorded as deepwater in "The Shellfish of New Zealand."

Hen Island is a small rugged island, about 3 miles long, very similar in topography to the Whangarei Heads. This island was also visited from Leigh under Government permit. Flat land for setting up camp is hard to find.

The most interesting item to be found here is *Rhytida tarangaensis.* This was rather rare in a coastal nikau glade, due to the proximity of carnivorous native rats. However, a 900ft. climb in half a mile leads one to a habitat where they are more plentiful. The ground here is made up of loose stones. The *Rhytida* are to be found under debris between these. *Paryphanta busbyi* occur in the more remote areas.

The number of marine molluscs found in one small bay, Old Woman's Cove, was very large, numbering over 50. Included were a number of *Nudibranchs* and a live *Phillipea lutea.*

A visit to Cavalli Island in December showed the success that can be had by visiting a rarely visited spot. These islands are privately owned and lie between Whangaroa and Bay of Islands harbours. It is reached by travelling 2½ miles in a Maori fishing boat with outboard, from Matauri Bay.

Though the open White Beach yielded one rare mollusc, *Phillipea manifesta,* a sheltered cove where shells and sand had collected for some time without being scoured out by storms, supplied a good variety of shells, some rare. All of these have not been identified, but interesting specimens include—

Acar sandersonae Powell—uncommon.
Acar sociella Brookes—common.
Paraclanculus peccatus Finlay—uncommon.
Herpetapoma larochei Powell—1 specimen.
Zelippistes benhami (Suter)—1 specimen.
Ellatrivia memorata Finlay—rare.
Austrosassia parkinsoniana (Perry)—rare.
Vicimitra maoria Finlay—rare.
Proximitra obscura (Hutton)—not common.
Nassarius spiritus (A. Adams)—1 specimen.
Scrinium sandersonae Powell—1 specimen.

Cylinchnina thetidis (Hedley)—1 specimen.

There is litle bush on the island, but *Rhytida dunniae* and *Murdochia pallida* have so far been identified amongst the snails found in the bush inaccessible to cattle.

Little Barrier Island was visited under Government permit, and our trip was made on the "Gunner" from Leigh, owned by Captain

Norman Warren. The sea is often turbulent in these parts and even good sailors are glad to make a landfall.

On approaching the landing one is impressed by the sea wall, about 12ft. high, that has apparently been laboriously built right round the island. At a closer view, this resolves itself into a pebble beach, i.e., a beach of smooth, rounded stones, moved continuously by normal wave action.

This habitat is rather extreme for molluscs, and only about 12 have managed to colonise it successfully. From the top of the beach down, these are :—

1. *Suterilla novaezelandica.* This is a small gasteropod, like the Liareas adapted to air breathing and it lives high above the high tide mark, in storm debris under the shade of pohutukawa trees. In this habitat is the meeting of marine and land molluscs, for here at the same level can be found such snails as *Phenacohelix* and *Ptychodon.*

2. *Melaraphe oliveri.* Always present at the top of the storm-bank.

3. *Marinula filholi.* This pulmonate occurs under stones at about neap tide. Further evidence of the "beach" nature of this habitat is given by the fact that this and other molluscs live below the surface level as do the burrowers in the sandy beach.

4. A number of surface dwellers occur from this point down to below mid-tide level. Living highest up is *Nerita melanotragus,* which, due to its tolerance of the sun, remains dotting the beach long after the tide and other molluscs have retreated. These other molluscs include the trochids, *Zediloma morio, Z digna,* rarely *Z. atrovirens.* The latter two feed on *Eklonia.*

5. As the beach is built up by wave action, there is a gradation in size of stones, from large stones at low tide up to smaller pebbles at high tide. The former are fairly stable and harbour the common rock-dwellers *Cellana ornata* and *C. radians.* *C. ornata* is rare here, as it prefers rough surfaces. (The same relationship is found on open rock at the island where the ridged *Notoacmea pileopsis cellanoides* lives in niches beside *N. pileopsis pileopsis* on the smother rock). Under stones in this region *Notoacmea daedala* and *Atalacmea fragilis* are common.

Open rock and reefs are many hours tramping from the landing site and there are no sandy beaches, so that marine collecting is very restricted on the island.

Forty two land molluscs were found. These occurred mainly in the valleys away from the track, so that land snail collecting may also be restricted. However, beautiful bush and birds, as well as an interesting moss-covered forest at the summit, makes track-following well worth the effort.

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OBITUARY.

It is with great regret that we record the passing of our highly-esteemed Life Member, Mr. A. E. Brookes, who suffered poor health for some time prior to his death on the 26th January, 1955.

Mr. Brooks was a keen naturalist and during his lifetime did a considerable amount of valuable research on Coleoptera and Mollusca, particularly the small New Zealand land snails. He published a number of papers and was in earlier times acquainted with Henry Suter, author of the Manual and Atlas of New Zealand Mollusca. Several shells have been named after him. Latterly Mr Brookes spent more time on our endemic beetles, and was regarded as a world authority on these.

Always a keen supporter of our Section, Mr. Brookes assisted in numerous ways. He served on the executive for some time and during the years 1948-49-50 was President. His sincere encouragement and help, particularly to newer members with their many problems, was greatly valued. His decease will be a sad loss to the Section and to all fellow research workers, as his activities were well-known throughout New Zealand.

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NEW ZEALAND BIOTIC PROVINCES.

By A. W. B. POWELL, *Auckland Museum.*

(Read at a meeting of the N.Z. National Committee on Oceanography, September 16, 1954).

If all organisms were pelagic their distributional patterns would more or less correlate with the physical factors of water, temperature, ocean currents, and prevailing winds.

However, the fact that many organisms lack, or have poorly-developed free-swimming larvae introduces a percentage of stenozonal species or sub-species. and the presence of these to a marked degree gives rise to the necessity of subdividing regions or subregions into provinces.

A past or present topographic barrier often serves as a segregating influence but such barriers are not essential, for mere distance is often sufficient to outrange the distributing powers of many stenozonal organisms. This is well instanced in the case of the North American West Coast, where three somewhat overlapping provinces are apparent.

A province may be defined as an area within a faunal region that exhibits a marked percentage of endemism.

Published proposals for the sub-division of the Maorian Sub-region are as follows :—

All the provinces so far nominated for New Zealand apply to the intertidal zones plus the shelf. The pelagic elements have been noted, but more or less as influences only.

When faunas from the deeper waters are better known it will almost certainly be found that provinces are fewer, more extensive and bear little or no resemblance to the inshore ones.

We may therefore have to consider the problem as three dimensional, i.e., (1) Broad oceanic areas for pelagic faunas; (2) Inshore and shelf faunas; (3) Deep sea faunas (probably divisible into several levels).

In 1925 (Verbeek Birthday Volume) Dr. H. J. Finlay published a manuscript scheme of Iredale's for the division of the Maorian subregion into five provinces. These divisions were —

The Kermadec Province	—	Kermadec Islands.
The Cookian Province	—	North Island of New Zealand.
The Forsterian Province	—	South and Stewart Islands.
The Moriorian Province	—	Chatham Islands.
The Rossian Province	—	Subantarctic Islands, including Macquarie Island.

In 1926 (Trans. Roy. Soc.) Finlay added the proviso that the Cookian and Forsterian may not be natural as previously defined and suggested that in the event of readjustments these names apply to the southern portion respectively of each island.

In 1937 (Discovery Reports) I contributed a further province, the Aupourian, and suggested more precise boundaries for the Cookian and Forsterian. These were:—

Aupourian: North Auckland Peninsula and Three Kings Islands from above Ahipara on the West Coast and Whangaroa on the East Coast.

Cookian: Rest of the North Island and the Northern part of the South Island down to Westport on the West Coast and Banks' Peninsula on the East Coast.

Forsterian: Otago and Stewart Island.

In 1940 (Trans. Roy. Soc. N.Z.) I adhered to my previous definition of the Aupourian and stressed the strong representation of the Peronian, that is the New South Wales element in the fauna.

In 1944 (Trans. Roy. Soc. N.Z.) Fleming defined the provinces in general terms, but did not give precise boundaries. He linked the provinces with physical factors as follows:—

Aupourian—within the Subtropical Zone of surface water.
Cookian—mixed waters of middle region of New Zealand.
Forsterian—isolation plus predominant Subantarctic waters.
Moriorian—isolation and mixed waters.
Rossian—entirely within the Subantarctic Zone of surface waters, plus isolation.

In 1951 (Discovery Reports, vol. 26, p. 67) I advocated dropping the name Rossian Province and substituting a prior name of Waite, 1916, the Antipodean (i.e. Antipodes District) for the Subantarctic Islands of New Zealand, including Macquarie Island, Stewart Island and Southern Otago.

In 1949 (Report of the Sixth Science Congress, Royal Society of New Zealand, vol. 76, part 5) Miss L. B. Moore summarized the propositions of Cockayne, 1928; Powell, 1936; and Fleming, 1942; in "The Marine Algal Provinces of New Zealand," Miss Moore remarked that "It is not yet clear whether the equivalent of Powell's Aupourian Province can be recognised for the marine algae, but if so it would extend at least as far as Bay of Islands and Poor Knights, and would then include some 14 species not otherwise known on the New Zealand mainland."

fn 1952 (N.. Geological Survey Pal. Bulletin 18, p. 16) Mr. N. de B. Hornibrook in monographing New Zealand Tertiary and Recent Marine Ostracoda quotes me (correspondence) as follows: "I have recently gathered good evidence for extending the Aupourian to as far as East Cape, but on the West Coast it does not seem to reach below Ahipara."

In my "Mollusca of the Southern Islands of New Zealand," Cape Expedition Series, Bull. 15, pps. 6, 7, I proposed a re-orientation of the Antipodean (Rossian of Finlay) as follows:—

Forsterian—Snares Island, Stewart Island and Otago.
Antipodean—Antipodes, Bounty, Auckland and Campbell Islands.
Kerguelenian—Macquarie Island, Kerguelen, Heard Island, Marion Island, Prince Edward Island and Crozets.

Since this was written (Fleming, 1951) published a bathymetric chart of the area which is in harmony with the above independently-reached conclusions. I note that Fell also (1953) in his Echinoderms from the Subantarctic Islands of New Zealand separates the Snares fauna from that of the other southern Islands, and places it in the Forsterian.

I note also that Dell in the N.Z. Oceanographic Committee's O.R 82 reports the finding of many species of mollusca previously recorded only from off the Snares Islands, in the Chatham Islands expedition Station 34, from 130 fathoms east of the Chathams. This is relevant to my forecast that provinces may be fewer and more extensive in the deeper waters. Before treating the New Zealand Provinces in some detail I should state that the Kermadec Province has been omitted, since most writers consider that this province does not truly belong to the Maorian sub-region.

Mr. Dell contributed an excellent paper on the molluscan fauna of this province to the Eighth Pacific Science Congress (not yet published) in which he considered the Kermedac fauna to be an outlying subregion of the Indo-West Pacific of equal value to the Philippian for Lord Howe Island and the Montrouzierian for New Caledonia.

Aupourian :

This province is charcaterised by a large percentage of Peronian organisms which have obviously reached here through the agency of the East Australian or Notonectian warm water current and subtropical or approaching subtropical conditions have enabled them to stay.

The molluscs include several species of the *Cymatiidae, Agnewia tritoniformis, Xenogalea pyrum* and *labiatum, Tolema* and *Emozamia.* The echinoids are represented by the fire-brick starfish *Asterodiscus* and the crustacea by the frog crab *Lyreidus.* Some of the exotic genera that have reached here by means of the Notonectian current have since developed as local subspecies.

After ignoring the relatively constant influx of Peronian and other wide ranging species, some of the characteristics elements of the Aupourian are :—

The carrier shell, *Xenophora neozelanica, Tonna haurakiensis, Pteronotus eos, Gomphina maorum, Alcithoe depressa, Venericardia reinga, Haliotis virginea crispata,* the large heart-urchin, *Brissus gigas,* and the brachiopod, *Terebratella haurakiensis.*

Evidence of the former cold phase in the Aupourian is exhibited by the presence of the Subantarctic bivalve molluscan genera *Gaimardia, Kidderia* and *Costokidderia.* The presence of the giant kelp, *d'Urvillea,* the Cookian limpet, *Cellana denticulata* and a record of the Forsterian Cymatid mollusca *Fusitriton laudandum* may be related to prevailing southwest wind and the upwelling cold water on the West Coast under present conditions.

It should be pointed out also that the configuration of the Northland West Coast results in the prevailing south west wind operating on shore in the north but off shore in the south.

It is worthy of note in regard to the extra limital distribution of *Cellana denticulata* that its northern occurrences are invariably on offshore islands or on strongly projecting land features. It suggests that point to point distances may be achieved within the time factor in situations where strong tidal currents operate, but that the larval free swimming period is not sufficiently long to enable a more thorough dispersal into the embayed sections of the coast line.

A review of the evidence now suggests more positive boundaries for the Aupourian. All interests seem to be in agreement that the eastern boundary should be the East Cape. The western boundary is not so clearly indicated, due to the conflicting effects of the Notonectian warm water current, upwelling cold water and prevailing south west winds, but a division of some elasticity is indicated as occurring between Reef Point, Ahipara and Manukau Heads.

Recent records of *Zeacolpus ahiparana* from Manukau Heads and *Tonna haurakiensis* from off Maunganui Bluff suport this contention.

Cookian:

The Cookian as pointed out by Fleming (1944) occupies the middle region and is largely in a belt of mixed waters with both subtropical and subantarctic influences.

The northern boundaries seem reasonable in relation to those fixed for the southern boundary of the Aupourian. The southern boundaries for the Cookian can be conveniently fixed as far as the littoral is concerned by the buffer zones represented by long shingle beaches on each coast, with impoverished fauna that separate the Cookian from the Forsterian. That these boundaries do not apply so rigidly for the shelf fauna is clearly shown by occurrences of warm water genera trawled both off Timaru and off Greymouth. The species instanced are *Galeodea triganceae* recently described by Mr. Dell and the northern *Ranella multinodosa.*

The Cookian as at present constituted is complicated by the assumed comparatively recent formation of Cook Strait and the evidence of a middle Pliocene division between the islands, approximately between Wanganui and Napier.

Some of the characteristic Cookian stenozonals are *Verconella ormesi, Cellana denticulata, Thoristella chathamensis cookiana* and *Buccinulum colensoi,* which ranges from the Wellington east coast to East Cape.

Forsterian:

The Forsterian is a well defined province including the whole of Otago and Stewart Island. I have in my report on the Cape Expedition extended the province to take in the Snares Islands, which are situated on the South Island shelf. The molluscan fauna of the Snares is clearly Forsterian rather than Antipodean (= Rossian).

It is worthy of note that Dr. Fell in his latest paper (1953) "Echinoderms from the Subantarctic Islands of New Zealand" also considers the Snares fauna to be essentially Forsterian.

The most characteristic species of the Forsterian is the limpet *Cellana redimiculum.* The subantarctic influence is as would be expected more marked than in the Cookian. The genera involved are *Gaimardia, Kidderia, Costokidderia, Margarella* and *Kerguelenella.*

The occurrence in the estuarine waters of the Manukau Harbour of a mollusc simulating if not identical with the common Forsterian coast *Venustas punctulata urbanior* is puzzling. Since the stations are different one explanation is that the Manukau occurrence merely represents an ecological variation of the common northern typical species.

However, another possibility occurs to me after hearing a paper by Drs. Habe, Kuroda and Miyadi at the Eighth Pacific Science Congress, entitled "Some Problems on Marine Biogeographical Micro-Provinces surrounding Japan." These authors point out that in southern Japan cold water continental coastal fauna elements often survive in harbours, whereas the adjacent open coast may have a warm water fauna belonging to a different marine province.

The Manukau *Venustas* may therefore be a relic from a past colder climatic phase when the Forsterian elements would presumably have extended much further north.

We have such evidence in the Nukumaruan North Island occurrences of the scallop *Chlamys delicatulus,* which at present does not seem to occur alive north of Otago Peninsula.

A recent finding of two examples of the brachiopod *Neothyris lenticularis* in 80 fathoms off East Cape may represent another survival of an at present otherwise restricted Forsterian element.

The percentage of species or subspecies restricted to the Forsterian is quite considereble.

Antipodean :

This is the name which I contend should replace Finlay's Rossian from which I exclude the Snares as already mentioned, and also Macquarie Island, which I place in the Kerguelenian.

This province lies entirely within the Subantarctic zone of surface waters. The fauna is an impoverished one, including only the most tolerant of the mainland genera with a liberal sprinkling of the characteristic Subantarctic genera: *Patinigera, Pareuthria, Margarella, Kerguelenella* and *Plaxiphora.*

Endemism is high with both elements in the fauna.

Kerguelenian :

In my report on the Cape Mollusca I advocate segregating Macquarie Island from the Antipodean on the evidence of the inclusion in the fauna of a number of stenozonal truly subantarctic genera that do not occur in the other New Zealand Subantarctic islands, i.e., *Falsilunatia, Puncturella* typical, *Tropohn* typical, *Prosipho, Admete,* and *Lima pygmaea.*

That Macquarie Island was formerly more closely linked with the New Zealand shelf is indicated by the presence of *Tawera, Chlamys delicatulus,* a *Venustas* of the *spectabile* group, *Plumbelenchus,* and the limpets *Notoacmea pileopsis sturnus,* and *Actinoleuca.*

The presence of the genus *Cymatona,* known elsewhere only from the East Australian Continental shelf is a surprise element in the Macquarie fauna.

Moriorian :

The Moriorian was nominated for the Chatham Islands fauna, which has a considerable percentage of endemic subspecies and shows strong northern and southern influences in almost equal amounts, as one would expect from the situation of the group.

I make no further comment on this province at present, for the results of the Chatham Islands (1954) Expedition will shortly have to be considered. This report is being prepared by Mr. R. K. Dell, of the Dominion Museum, Wellington.

An estimate of the number of marine species in each of the six New Zealand Faunal Provinces is as follows:—

1.—Aupourian	665	5.—Antipodean	225
2.—Cookian	602	6.—Kerguelenian : (Macquarie Id. only)	55
3.—Forsterian	444		
4.—Moriorian	260		

VARICES ON CASSIDS.

By A. H. JONES.

In No. 8 Bulletin, Mr. Paul mentioned several peculiarities associated with the leaving of varices on Cassids, notably the new growth stage following the varix having a different or non-existent colour-pattern, and the fact that there is loss of the usual high polish on the shell.

Several specimens in my collection show the peculiarities mentioned by Mr. Paul.

Xenophalium pyrum, from Buffalo Beach, Whitianga: The pattern has quite disappeared but comes out again, first slightly diffused and then becoming stronger towards the new lip. There is also a slight dulling of polish outside the shell.

X. collactea, from Mt. Maunganui: The varix has been partly dissolved and the new growth commenced from the outer edge of the old lip, leaving a V-shaped ridge on the outside. There is also a definite lack of polish and the pattern almost non-existent. With this shell there appears to be a partial recovery with the pattern gradually becoming stronger towards the new lip.

X. pyrum, locality unknown: This has the full varix left on the shell. The new growth is ridged and irregular, with the colour pattern very weak and diffused, and shows a definite loss of polish. The pattern also shows a slight improvement with the growth becoming smoother and more regular towards the new lip.

These three examples seem to agree with Mr. Paul's theory that, through disease or lack of vitality, the animal has been unable to produce the solvent which dissolves the outer lip. The last mentioned example also points to a reduced activity, for a period, of the mantle, causing the new growth to be rough and irregular, until the animal has made a recovery.

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THE GENUS SCROBS WATSON, 1886.

By A. K. HIPKINS.

All the members of this genus, which belongs to the family *Rissoidae* are microscopic, and those collectors who are interested in this type of material are almost certain, sooner or later, to come across one or more species. They occur throughout New Zealand from low tide to deep water.

The most common species appears to be *Scrobs hedleyi* (Suter), which is found in "stone washings" from the east and west coasts of both islands and Stewart Island. First described by Henry Suter in 1908, it was collected by him from Maloney's Reef, Hauraki Gulf. The colour of this shell varies from a bright pink—the most usual shade—to red, pale horn or white. The spiral lines may be distant and rather heavy, or fine and close together. Aperture usually whitish. (That Suter incorrectly described the protoconch of this species has been mentioned by Mr. Powell on his paper on *Rissoids.* The protoconch is one of the main points of identification of the group. The sculpture consists of numerous extremely fine stippled lines, usually covering one and a half whorls. The slightest erosion would efface it).

Height 1.2 m.m. Diameter 0.7 m.m. (Specimen illustrated from Leigh stone washings).

Scrobs h. angulatus Powell, the subspecies, is without doubt the most handsome of the genus and is easily distinguished by its more prominent spiral keels. It is also slightly taller and very much broader. The third keel may be present or absent. If absent, the angle of the aperture is not so pronounced. Spiral lines between the keels may be extremely fine and close together. Some specimens are devoid of sculpture and are smooth. The colour also varies as in *hedleyi.*

Type locality Mangonui, 6 to 10 fathoms. (W. La Roche). Specimen illustrated 9fms. Whangaroa Harbour. I have collected one specimen only, alive. Not common in shell sand (Aupourian). Height 0.9 m.m. Diameter 0.6 m.m.

Scrobs ovata Powell, 1927. The adult whorls are smooth except for a few spiral lines on the base. The peristone is continuous and duplicated, not sharp like *angulatus,* which is also double. The suture is distinctly margined. I have not seen live specimens. Dead specimens pinkish, pale horn or nearly white.

Height 1 m.m. Diameter 0.5 m.m. Illustrated specimen from shell sand (Aupourian), McLeod's Bay, Tryphena, Great Barrier Island.

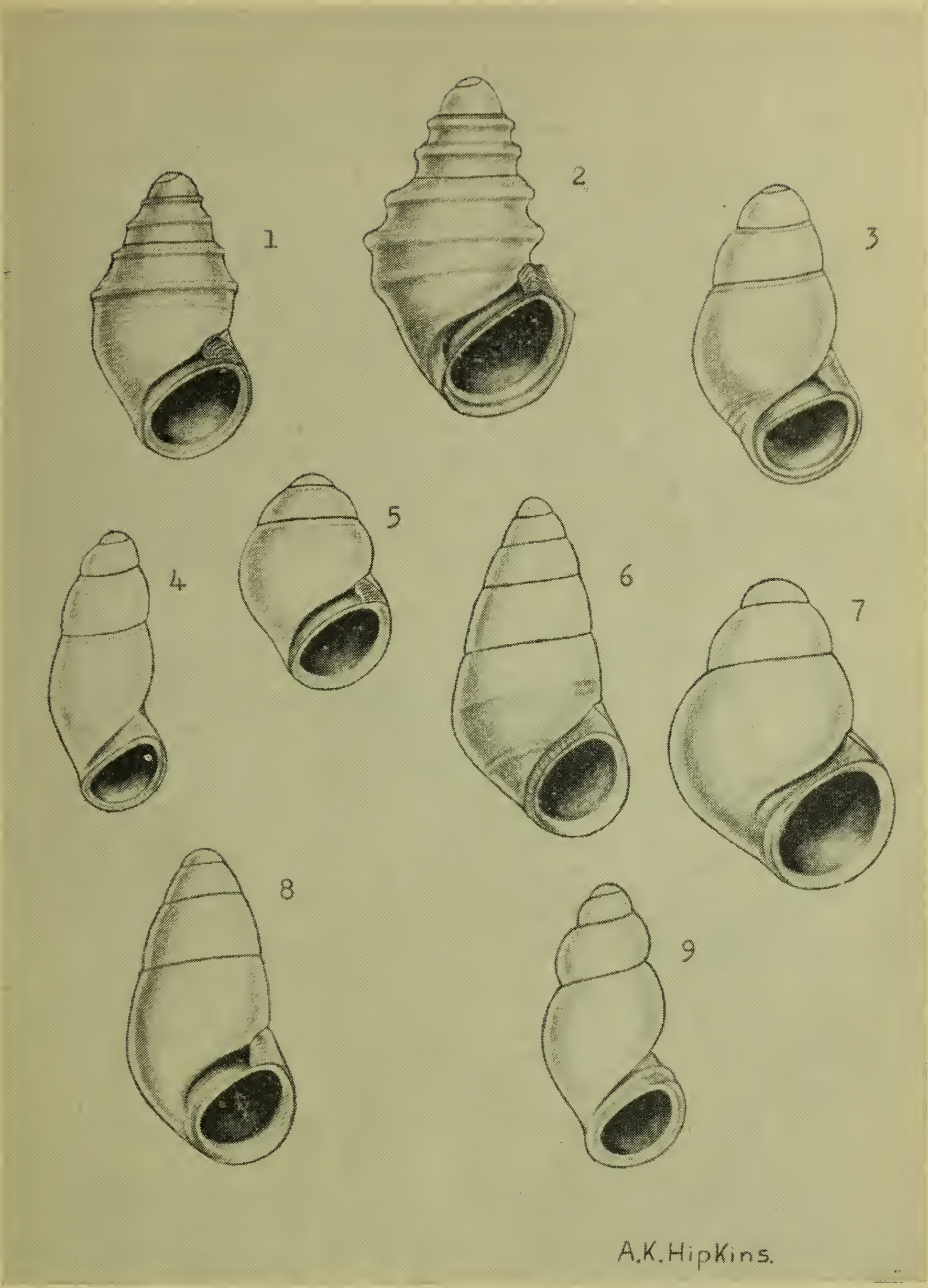
Scrobs elongatus Powell, 1926. The name aptly describes the species. It is very narrow and cylindrical, the whorls are slightly convex and the suture is margined. The aperture is separated from the body whorl by a shallow V-shaped depression. The peristone is continuous, double, rounded. Dead specimens sometimes show a slight tinge of pink, but they are mostly white.

Dredged off Mangonui in 6 fms; Doubtless Bay (W. La Roche). This species is found in shell sand in the Aupourian Province. Mr. Powell also records it from shell sand and beach drift, Mason's Bay, Stewart Island. Height 1.1 m.m. Diameter 0.45 m.m. Specimen illustrated is from 22fms. Stevenson's Island, 3½ miles from Whangaroa. Normally the post nuclear whorls are quite smooth, but this specimen shows with the aid of strong lighting exceedingly fine spirals on all whorls.

Scrobs rugulosus Powell 1930. This species is about the same size as *hedleyi* and the whorls are broadly ovate, the post nuclear being sculptured with somewhat indistinct broken, wavy, spiral striae, becoming more prominent on the base. The suture is impressed, submargined by a moderately wide band. The aperture is obliquely oval, peristone continuous, much thickened below and connected to the body whorl by a heavy laminated callosity. The apertural cleft is moderately wide and somewhat crescent shaped. Colour dull pink, protoconch dull pink, base and aperture whitish.

Type locality: Tryphena Bay, Great Barrier Island, 5 to 6 fms. (Dredged by A. W. B. Powell, 1924). Also found in shell sand, Aupourian zone. (Illustrated specimen, 9 fms. inside heads, Whanagroa Harbour, 1-3-53).

Scrobs semen (Odhner). This is the tallest of the group. The spire is high, conical, whorls five and a half, including the dome shaped protoconch. The sides are almost straight, suture lightly impressed. There is a shallow peripheral groove, below which is a slightly raised, rounded cord, running from the apertural cleft around the base. The cleft, which is narrow, is of equal width, but rapidly widens toward the outer lip. Within the shallow cleft are slightly raised ridges running from the aperture around the base. Aperture is oval and much thickened within.



1. Scrobs hedleyi (Suter, 1908).
2. Scrobs hedleyi angulatus Powell, 1927.
3. Scrobs ovatus Powell, 1927.
4. Scrobs elongatus Powell, 1927.
5. Scrobs rugulosus Powell, 1930.
6. Scrobs semen (Ohdner, 1924).
7. Scrobs crassiconus Powell, 1927.
8. Scrobs excelsus Powell, 1927.
9. Scrobs trailli Powell, 1939.

The colour of live specimens is uniformly dark brown, dead specimens pale horn. These are not uncommon in seaweed washings. Dead specimens may be found in shell sand.

Type locality: Cape Maria van Diemen. On seaweeds. (Mr. Powell also records this species from seaweeds, Houghton's Bay, Cook Strait). Illustrated specimen from shell sand, McLeod's Bay, Tryphena, Great Barrier Island. Height, 2 m.m.

Scrobs crassiconus Powell 1927. Shell quite large for the genus, solid, rotund. Whorls three and a half, including dome shaped protoconch. Post nuclear whorls smooth, outline of whorls moderately convex, spire bluntly conical and slightly higher than height of aperture. Peristome continuous, thickened. Aperture obliquely oval, separated from the body whorl by a cleft which runs quite deeply under the sagging body whorl. Colour dull white (dead shell).

Type locality: Tryphena, Great Barrier Island, 5 to 6 fms. (A. W. B. Powell). Further records: Off Three Kings, 260 metres, R.R.S. Discovery II, Station 932. Off Big King, Three Kings, 100 fms (Dr. J. H. Finlay Collection).

Illustrated specimen from half mile off northwest side, Stevenson's Island, 2fms. This specimen is in the writer's collection. This species is apparently quite rare. Height 1.26 m.m. Diameter 0.86 m.m. (Holotype).

Scrobs excelsus Powell 1933. Shell solid, elongate, cylindrical. Whorls 4¼, including the dome shaped protoconch. Post nuclear whorls smooth. Outlines conical, protoconch and succeeding whorls slightly more convex. Aperture obliquely oval, peristome continuous, thickened within; separated from the parietal wall by a wide cleft. Outer lip connected to body whorl by a heavy thickened callosity. Colour ochreous buff. Height 1.52 m.m. Diameter 0.66 m.m. Holotype. Auckland Museum. Illustrated specimen dredged 22 fms. ½ mile n.w. side of Stevenson's Island. (Nine dead specimens, December, 1954).

Scrobs traílli Powell 1939. This species is much larger than the *hedleyi*. It is tall with rather convex whorls. Whorls three and a half, including the protoconch of one and a half globose whorls. Post nuclear whorls smooth, shining. Colour of fresh specimens bright crimson, fading to white on the base, aperture white. Aperture obliquely oval. Between the double peristome is a slight groove. Outer lip thickened. In this species the lip is not connected to the body whorl by the callus in the usual manner. A narrow cleft, becoming deeper and wider on reaching the outer lip, separates the aperture from the parietal wall.

Type locality: Mason's Bay, Stewart Island. (Shell sand).
Height of holotype 1.5 m.m. Diameter 0.8 m.m.

Illustrated specimen presented to me by Mrs. C. Smith, Stewart Island, from Foveaux Strait fishing grounds in 20 fms. (dead shell). This shell is slightly taller than the type. Mrs Smith mentions that this species is not at all common.

A collection of the more common species from various localities, in shell sand samples has shown that although variations in outline and other details do occur, most of these are easily identified as one or other of the species.

I would like in conclusion, to record my thanks to Mr. Powell for his generous assistance in checking and comparing the material with holotypes and paratypes in the Museum collection.

References:

Powell, A. W. B. The Genetic Relationships of Australasian Rissoids, Part 1. Descriptions of New Recent Genera and Species from New Zealand and Kermadec Islands. Trans. N.Z. Inst., vol. 57, pps. 534-548, 10th March, 7927.

Powell, A. W. B. On Five New Species of Recent N.Z. Mollusca. Proc. Malac. Soc. Lond. vol XX, Part IV. March 1933, pps. 194-198.

Powell, A. W. B. The Mollusca of Stewart Island. Rec. Auck. Inst. Mus., vol. 2, No. 4, pps. 211-238. 27th Oct. 1939.

Powell, A. W. B. New Species of N.Z. Mollusca from Shallow Water Dredgings. Trans. N.Z. Inst., vol. 61, pps. 536-526. 29th Nov. 1930.

Powell, A. W. B. The Mollusca of the Aupourian Province, N.Z. Trans. Proc., Royal Soc. of N.Z., vol. 70, Part 3, pps. 205-248, December 1940.

NOTES ON LAND SNAILS COLLECTED NEAR LEIGH.

By T. P. WARREN.

As I have not long been actively interested in Land Snails I do not suppose I have found all the species which occur in this area. But I will mention those of interest which I have found so far. Most of my collecting has been done in a patch of bush just below my house, so I don't have to go far to hunt for material. A second locality is a 30 acre stand of bush on our run-off at the top of the Pakiri hill. So far I have not hunted there to any extent, but hope to do more collecting there at a later date. This place I refer to as "the ranch," while the home area is designated "Warren's bush."

Rhytida dunniae is the largest snail found here and is of fairly common occurrence, mostly in bracken fern at the edge of the bush. The specimens are not as big as those found further north, being about the size of the Auckland examples. It is not unusual to find one busily devouring other snails such as Liarea or Laoma.

I have sometimes come across *Otoconcha dimidiata* under pieces of wood and in nikau leaves in wet places. The animals are most attractively marked with spots and dashes of a blackish brown colour. When at rest the animal lies with its tail curled around its head just like a dog. If placed in spirit they leap and twist with violent movements. This has been noted by Mr. Dell in his paper on the family.

Two species of *Liarea* occur here—*L. turriculata* and *L. ornata,* the latter being the more common. This is a very pretty little shell, with white zig zag bands and a brown background. It is mostly found under dead leaves in damp parts of the bush, though I have found it beneath loose stones as well.

Our other operculate genus, *Murdochia,* is represented by *M. cytora,* a very small shell, and *M. pallida,* which is about twice as big. Both are to be found on punga fronds on the ground, mostly where there is plenty of moisture, but they are not at all easy to see. Another snail is found in their company—this is *Omphalorissa purchasi,* once known as *Hydrocena.* It is a minute species and under the microscope is seen to have an operculum. Fresh specimens are pinkish, with the dark animal shining through the shell, while dead ones have a whitish appearance.

Under dead leaves I have found a good many specimens of *Laoma poecilosticta* and its sub-species *conicula.* This may be distinguished at once under the microscope by its more rotund shape and the fact that there are no plates within the aperture, though the columella tubercule remains

Serpho kivi is common on kohekohe trees, usually living ten or more feet above the ground. Dead shells are to be found scattered on the ground below the trees, sometimes the odd live specimen is there too.

Other *Flammulinid* species found under leaves are *Suteria ide,* which is scarce here; *Therasia tamora* with a row of little plates round the periphery of the whorls; and *Thalassohelix zelandiae,* which is found in wet bracken with *Rhytida.* This is a very active species when taken alive.

Phenacohelix ponsonbyi is common in dead nikau leaves, also on the trunks of the palms; *P. Pilula* is rather rare, the only times I have found this one were when I was looking under dead manuka twigs.

Flammulina pilsbryi is also found under manuka, mostly in fairly open places. It is a very tiny shell, but most attractive when placed under the microscope. I was fortunate in finding a couple of fairly good specimens of *Flammulina cornea* in a creeping plant not unlike the cabbage tree.

Thalassohelix ziczag is found at the "ranch" on rare occasions, mostly under punga leaves or in mould. A snail which at first sight looks similar is *Allodiscus dimorphus.* This I have taken from nikau trees, also from parasite plants on rimus.

Charopa coma is found under rotten logs, mostly one finds several together if they are there at all. Once I found a colony under an old puriri stump some distance out in the paddock. With them were several *Fectola caputspinulae,* all alive. The *Fectola* also lives under manuka sticks and in cabbage trees.

On coprosma plants I have found *Phrixgnathus erigone,* living on the underside of the leaves. This is a conical shell not unlike *Laoma leimonais* (which does not seem to live here). Another *Phrixgnathus* species I have found is *P. moellendorfi,* which lives under dead twigs and is nearly black when alive, but dead ones are seen to be hyaline with reddish radial blotches. Most of the ones I have found are living in fairly open places under manuka trees. Another tiny *Phrixgnathus* is to be found with them, but I have not managed to identify it yet.

I have come across a few specimens of *Delos coresia* on the ground, and found others in astelias, both on the ground and attached to trees. This appears to be the only *Delos* to be found here.

Perhaps I should also mention two snails found at the beach, or to be more correct, in the sand dunes. One is *Elasmias sub-perforata,* a tiny conical snail which is quite common under sand dune vegetation; found with it is a minute *Phrixgnathus,* which I have yet to identify. Both species are living at Pakiri and Whangateau ocean beaches, and Mr. Gardner tells me he has also found them at Tokerau. I have looked for *Austrosuccinea* here but have not found it so far, though I am still hoping it will turn up.

THE BLUE STORM SNAIL.

By A. H. JONES.

JANTHINA lives in tropical and semi-tropical oceans and occurs in vast shoals, sometimes as much as 200 miles across.

This mollusc floats with its shell upside down, hanging from a raft of silvery bubbles, which are renewed at intervals. From observations made of live specimens kept in captivity for a short period, the method of forming the bubbles seems to be as follows:—The part of the foot that normally is held against the last-formed bubbles is curled quickly back on the surface of the water; its base of intense velvety black, is pulled down into a funnel shape, and the edges drawn inwards so as to enclose an air bubble, which is smartly clapped on to the others. The foot then glides over this end of the raft, covering the bubble with a firm mucous skin. The process is completed in less than a minute. If the float is cut off the animal sinks and cannot rise again.

The young are contained in a small egg-case and are ejected by the mother from under the edge of the shell. The egg-case quickly swells and opens out to release a mass of tiny shells in the free-swimming stage.

Janthina feeds on another pelagic organism—*Velella* (By-the-wind, Sailor). Its dried transparent floats are often washed up in quantities, together with *Janthina* on our West Coast beaches. *Velella* when alive, are deep cobalt blue in colour, with many short tentacles below.

Janthina, when irritated, send out a thin jet of purple fluid, which, it has been suggested, anaethetises the tentacles of *Velella* and prevents the functioning of its stinging cells, thus enabling *Janthina* to feed on the animal without suffering any harmful effects from the stinging glands.

☆

SOME OBSERVATIONS ON SERPHO MATTHWSI, SUTER.

By N. W. GARDNER.

THE interesting small arboreal snail has always been considered rather rare, but in reality is not uncommon in the remnants of bush about Cape Maria and Spirits Bay.

Suter, in his *Manual,* records it from Kaitaia on the authority of R. H. Mathews, but the writer has not been able to secure specimens from here, nor has he seen any recently collected samples.

Specimens approaching the typical colour pattern as described by H. Suter: "Protoconch light yellowish, with arcuate radial fuscuous streaks, which are present on the next volution, but become obsolete, giving place to a uniform light brown colour, interrupted only by a whitish band below the suture and a white central disc on the base" occur on the range of hills running from Cape Reinga to Pandora. The light brown colour, however, is replaced by a warm brown and the base is entirely white right from the periphery. The ribbing too, is rather finer and closer than is mentioned in the original description.

On the eastern side of Spirits Bay, at Unuwhao, the Waterfall bush specimens are pale yellowish with a few very small blotches of light brown colouring along the suture, while the base has a smaller area of white. The ribbing in these specimens is strong, unevenly spaced and further apart than on the examples from Pandora.

Serpho kivi Gray also occurs in the same area, living up in the trees, while many *S. matthewsi* show a decided preference for the low clumps of astelia on tree trunks or rock ledges.

☆

SNAILING IN WESTLAND.

By L. PRICE.

It was a hot day in January, 1954, and I had been working in Christchurch, but now at last I was on my way . . . the old car loaded with camping gear and well-provisioned. We were heading for the "Snail Country" among the mountains of rugged Westland.

A couple of days and many dusty miles later we pulled into the sleepy little town of Ross, nestling at the foot of bushclad mountains, one of which was to be my first objective. Here I hoped to obtain my first specimens of *Paryphanta rossiana.*

As it was getting late in the day, I decided on a conference with a local storekeeper about the track, then had a preliminary canter part way up in preparation for the morrow. Early next morning I really started tramping and in a couple of hours was in a position where I was supposed to turn off the main track on to an old trail which led to the summit, but it took me quite a while to find it, as it had become so overgrown through disuse. However, after an exhausting scramble, I was at last at the top of Mt. Greenland, 2,900ft.

Soon after I noted with a thrill, various pieces of *Paryphanta* shells about, and I knew I was on their trail. Nevertheless, after several hours searching I considered myself lucky to have half a dozen "lives" in the bag. This particular series is living only on the summit under a covering of wiry bog grass. Incidentally, in an old hut there, inhabited only by a dead opossum, I noticed several monograms, one: "Arthur Richardson, Papakura, Auckland, please write . . . "

By mid-afternoon a thick white mist reduced visibility almost to nil, so leaving the place wrapped in a damp shroud of silence, I quickly descended to civilisation again.

Next morning, retracing my steps almost back to Hokitika, I turned inland and soon reached the beautiful Lake Kanieri, situated in a bushland setting, and quite close was my next obstacle, Mt. Tuhua, 3,688ft. On seeing some workmen on the roadside I struck up a conversation and enquired as to the possibility of there being a track. As it turned out they knew all about the area, having been up there many times while deerstalking.

Leaving my car at the lovely lakeside camping ground, I commenced trekking onward and upward. My, that was a steep climb for the first hour! At about the 3,000ft. mark the trees gave way to tussock and everywhere clumps or large alpine daisies were in bloom. Finally I reached the rusty iron triangle which marks the summit, and on sliding down a few feet on the back slope, I began scratching around under the clumps of tussock. In a couple of hours I managed to find a dozen live *Paryphanta fletcheri,* which more than made up for that tough climb.

Here, also I was very interested in turning up a nice pair of *Rhytida patula* Hutton, living together with the *Paryphanta.*. In the middle of operations down came that wretched mist which seems to be a feature of the higher slopes, despite it being a fine midsummer day in the lower regions. Very soon every blade was dripping moisture, including "His Nibs." Fortunately, I have a fair sense of direction, but was very pleased to see the sun again as I dropped down to the lakeside in the late afternoon. As stores were in need of replenishing, I decided to move on to Greymouth that some evening. Afterwards I headed north to the Paparoa Range, but my friends, that is another story.

☆

LIAREA TURRICULATA WAIPOUA POWELL.

By N. W. GARDNER.

ALTHOUGH it was known from only two localities when Mr. Powell published his recent paper on this family, now, as a result of further collecting in the Northland area, we are able to give more records.

The two original localities were:—

Waipoua Forest, 21-1-57, type locality, N. G.

Broadwood, 21-1-50, N.G.

To these can be added the following additional records:

Donnelly's Crossing, 9-4-55, scarce. *L. egea tessellatus present.*

1 mile up Wekaweka Road, Opononi, 10-4-55, common. *L. egea tesselatus present.*

Takahe, west of Kaikohe, 10-4-55, not common.

Ohuri Road, Waima, Rawene, 10-4-55, not common.

In addition, Mr. L. Price has taken numerous examples from Larner's Road, Kaitaia. It can therefore be seen that this subspecies occupies a considerable area of the western side of the peninsula between Donnelly's Crossing and Kaitaia. Although numerous specimens of *Liarea* were collected from stations further south, no examples of *Waipoua* were seen.

The specimens from Waima and Takahe were of constant smaller size but this is probably due to the type of habitat, which was, in this case, small roadside copses of rather open bush.

Colour in all cases was dark brown, there being in the Waima and Takahe shells quite a few instances of a faint banding of lighter colour as mentioned by Mr. Powell, when referring to Broadwood specimens. None of the large series of specimens exhibited hydrophaneous pattern, and nearly all were found amongst the dead leaves under taraire trees.

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BULLETIN No. 12

AUCKLAND, NEW ZEALAND

NOVEMBER, 1956

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CONCHOLOGY SECTION, AUCKLAND MUSEUM

BULLETIN No. 12

EDITORIAL.

AS A RESULT of the continued interest which our publication receives, and the gratifying response to the request for articles, we confidently present, this year, a slightly enlarged issue with several extra illustrations. This we feel sure will have your approval, for it reflects well on the state of affairs of the Section as a whole.

A glance at the papers printed herein, will reveal the wide range of interests within the Molluscan Family, that are vigorously pursued by members.

All the Section's activities during the past year have been well patronised, with very good attendances at our monthly meetings and keen gatherings on field days.

A notable asset acquired during the year was the Brookes' Collection of N.Z. Mollusca. This was purchased with the view to providing us with our own reference collection. The considerable sum needed for this transaction was voluntarily donated by members throughout the country—a very fine effort.

We feel that the current year has, so far, been sound and profitable in all respects.

To all who have contributed to this issue, directly or indirectly, we tender our thanks.

E. N. & N. W. GARDNER,
1st November, 1956.

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SERPHO MATTHEWSI SUTER.

By H. E. WHITTEN.

IN last year's Bulletin Mr N. Gardner compared examples of this species taken from Pandora with those from the Waterfall bush, Kapo, Wairua. Certain variations were noted. This tendency towards variation may be seen in comparing examples from other localities. I have collected specimens of this snail from the Huka valley, near Tom Bowling Bay, and from the Whareana valley, south-west from the North Cape, as well as from the Waterfall bush. Shells from both the Huka and Whareana valleys have the same type of strong unevenly spaced ribbing which can be seen in the Kapo Wairua specimens, but in each case the ribs are slightly more numerous than in the latter examples. The coloration of the Huka shells agrees very well with that found in those from Kapo Wairua. Examples from the Whareana Valley, however, show a pronounced variation. In these there are very prominent dark brown radial blotches crossing all the spire whorls from suture to suture, only fading out at the beginning of the body whorl. The area of white on the base is approximately the same on specimens form all three localities.

NOTES AND RECORDS FROM STEWART ISLAND.

By E. K. SMITH, *Halfmoon Bay.*

CRAYFISH POTS.

THE crayfishers around Stewart Island bring up with their pots quantities of what look like seaweeds. Masses of fine, brightly coloured growth, very pretty to look at, in clumps of from one to six inches in height, and in colours ranging through white, pink, orange and brown, with the orange and brown predominating. These seem to be mostly bryozoans and hydrozoans—branching flexible, colonial animals, not seaweeds at all. With them are mixed odd fragments of true seaweeds, perhaps a quarter handful to a bucketful of the bryozoans and hydrozoans.

Sometimes when a pot has been set in a very strong current, as in the passage between Big South Cape and Evening (Poutama) Islands, it becomes imbedded in the sandy sea-bottom, and, when lifted, brings up with it a mass of this "weed" and sand. From this are obtained a large number of molluscan species, many of them dead specimens. Frequently also blind eels are trapped, and the craypots become covered with their tough, tenacious and smelly slime. To this adhere many small deepwater molluscs, mostly dead. Odd clean clumps of bryazoans and hydrozoans however, coming up without sand, contain live specimens only; and from these I can list, so far, the following species:—*Austrosarepta trapezina, Cosa filholi, Perrierina* aff *Taxodonta* (globular form), *Cyclochlamys transenna, Sinezona laevigata, Notosetia stewartiana, N. infecta, N. neozelandica* and *Dardanula roseola.*

Of the larger species found in the crayfish pots, the commonest, in 25 to 35 fathoms, are *Eucominia nassoides* and *Argobuccinum tumidum,* with some *Venustus punctulata urbanior.* Others found are *Modelia granosa, Buccinulum marwicki* and *Glycymeris laticostata,* the first two in shallower water, and the last probably carried in by crayfish, which are sometimes seen holding them in their arms. Even the largest and heaviest *Glycymeris* may have pieces chipped out of the edges of their shells where the crayfish have been opening them.

As was perhaps to be expected, many of the Snares Islands species are turning up in the South Cape material.

ODD NOTES.

Notoacmea pileopsis sturnus. Thule, on high tide rocks, beneath overhanging "muttonbird" scrub. Nearby were *Leuconopsis obsoleta*

Eudoxochiton nobilis. 135mm in length, from near the lighthouse at the entrance to Halfmoon Bay.

Marginella albescens. A sinistral specimen from South Cape.

Pyramidellids and *Eulimids.* Searching for these, I examined carefully, inside and out, two dozen large sea eggs; and found one solitary live *Subonoba insculpta!* There is an *Odostomia* (or *Agatha*) to be found in the byssal threads of *Modiolaria impacta.*

This year a number of *Janthina violacea,* one *Argonauta* *nodosa*, and large quantities of Portuguese Man-of-War have come ashore, mostly at Mason Bay and thereabouts. The few records of *A. nodosa* of which I know, are all from this vicinity.

ADDITIONS TO LIST OF STEWART ISLAND MOLLUSCA.
No. 3.

96 *Escalima regularis.* Powell 1955. South Cape, 30fs.

118 *Cuna carditelloides.* Suter 1907. South Cape, 50fs.

172 *Pachykellia rotunda.* Powell 1927. South Cape; O.B.; F.G. 3, 4, 5, 7, 8; 8 to 50fs; S 4, s-s.

302.1 *Schizotrochus regius.* (Mestayer 1916), South Cape, 30fs.

Calliostomid sp. South Cape, 30fs. Very small shell, with high, gradate spire.

430 *Liotella rotula* (Suter 1908) Omit.

434 *Liotella rotuloides.* Powell 1937. South Cape; F. G.I., 5; 30 to 60fs. Replaces *L. rotula* of my 1953 list.

Conjectura N. Sp. South Cape and Port Adventure crayfish pots, 30fs.

526 *Cellana stellifera phymatius* (Suter 1905), Ringaringa Beach.

538 *Murdochia chiltoni* (Suter 1896) Halfmoon Bay; Whalers' Base; Little Glory.

Lironoba N. Sp. South Cape; F. G. 4, 5; 30 to 50fs.

682 *Notosetia lampra* (Suter 1908). South Cape; F. G. 4; 30-50fs.

Notosetia antipoda Powell 1955. South Cape; F. G. 4, 8; 15-50fs.

Notosetia N. Sp. South Cape; F. G. 3, 4; 5-50fs. A dumpy, spirally striate shell.

709 *Dardanula olivacea annulata* (Hutton 1884). Paterson Inlet, dredged off Vaila Voe, 10fs; Bravo Islands, l. s-w. w.

710 *Dardanula Olivacea Lutea* (Suter 1908). South Cape, 30fs.

Ruapukea N. Sp. South Cape, 30fs; S. 4, s-s.

766 *Specula styliformis* (Suter 1908). South Cape, 30fs.

Specula retifera (Suter 1908) ? South Cape, 30fs; F. G. 4.

771 *Specula odhneri* Powell 1927? South Cape, 30fs.

Specula? N. Sp. South Cape, 30fs. Somewhat like *S. Dissimilis,* but with different sculpture.

Alipta aff crenistria (Suter 1908). South Cape, 30fs.

782. *Zaclys sarissa.* (Murdoch 1905)? South Cape, F. G. 3, 4, 7, 8; 2 to 30fs.

783 *Zaclys subantarctica* (Suter 1908)? South Cape, 30fs. F.O.B.

788 *Sundaya tuberculata* Powell 1927? South Cape, 30 to 50fs.

790 *Hebeseila bulbosa* (Suter 1908)? South Cape, 30fs.

798 *Notosinister* (*Cautor*) *luteu* (Suter 1908). South Cape, 30-50fs.

Notosinister aff. huttoni (Suter 1908). South Cape, 30fs. White and more narrowly cylindrical than *huttoni.*

Notosinister N. Sp. South Cape, 30fs. Minute, smooth, sub-cylindical, light brown.

885 *Janthina violacea* Bolton 1798. Mason Bay.

Murdochella aff. levifoliata (Murd. and Suter 1906). South Cape, 30-50fs.

923 *Odostomia vaga* Laws 1939. South Cape; F. G. 3, 4; 10-50fs.

928 *Odostomia vestalis* Murdoch 1905. South Cape, 30fs S. 4; s-s.

940 *Gumina dolichostoma* (Suter 1908). South Cape. 30fs.

Eulimella sp. F.O.B.; F.G. 3, 4, 5, 8; 20-30fs; S.4, l.r. and s-w.w..

Eulimella sp. South Cape, 30fs.

1158 *Terefundus Quadricinctus* (Suter 1908). South Cape, 30fs.

11219 *Aoteatilia psila* (Suter 1908)? South Cape; F.G. 2, 3, 4, 8; 2-50fs.

1355 *Diacrea trispinosa* (Lesueur 1821). South Cape, 30fs.

1405 *Pleurobranchaea novaezelandia* Cheeseman 1881). Paterson Inlet, Bravo Islands, l.r.

1420 *Ctenodoris flabellifera* (Cheesman 1881). Paterson Inlet, Bravo Islands; Ocean Beach; l.r.

1426 *Glossodoris aureomarginata* Cheesman 1881. Halfmoon Bay, l.r.

*1512 *Allodiscus planulatus* (Hutton 1883).
* *Allodiscus cf smithi* (Suter 1894).
*1558 *Flammulina zebra* (Le Guillon 1842).
* *Ptychodon gadus* Dell 1954.
* *Ptychodon monoplax hiarara* Dell 1954.
Charopa (*pseudegestula*) *smithae* Dell 1954. Ringaringa; Ulva; Mason Bay.
Charopa sp.

1667 *Phrixgnathus phrynia* (Hutton 1883).

1668 *Phrixgnathus regularis* (Pfeiffer 1855). Ulva; Ocean Beach.

Phrixgnathus flemingi stewartiensis (Dell 1954).
Phrixgnathus rakiura (Dell 1954).
Paralaoma esricata (Suter 1890).
Atharocophorus aff. bitenticulatus (Q. and G. 1832).

1752 *Onchidella nigricans* (Q. and G. 1832). Boulder Beach, Ulva, l.r.

1767 *Icoplax kapitiensis* (Mesteyer 1926). F.O.B.; Paterson Inlet, dredged in 10fs, off Vaila Voe.

1771 *Paricoplax crocina* (Reeve 1847). F.O.B.

1783 *Notoplax violacea* (Q. and G. 1835). S. 4, 7; v.lr..

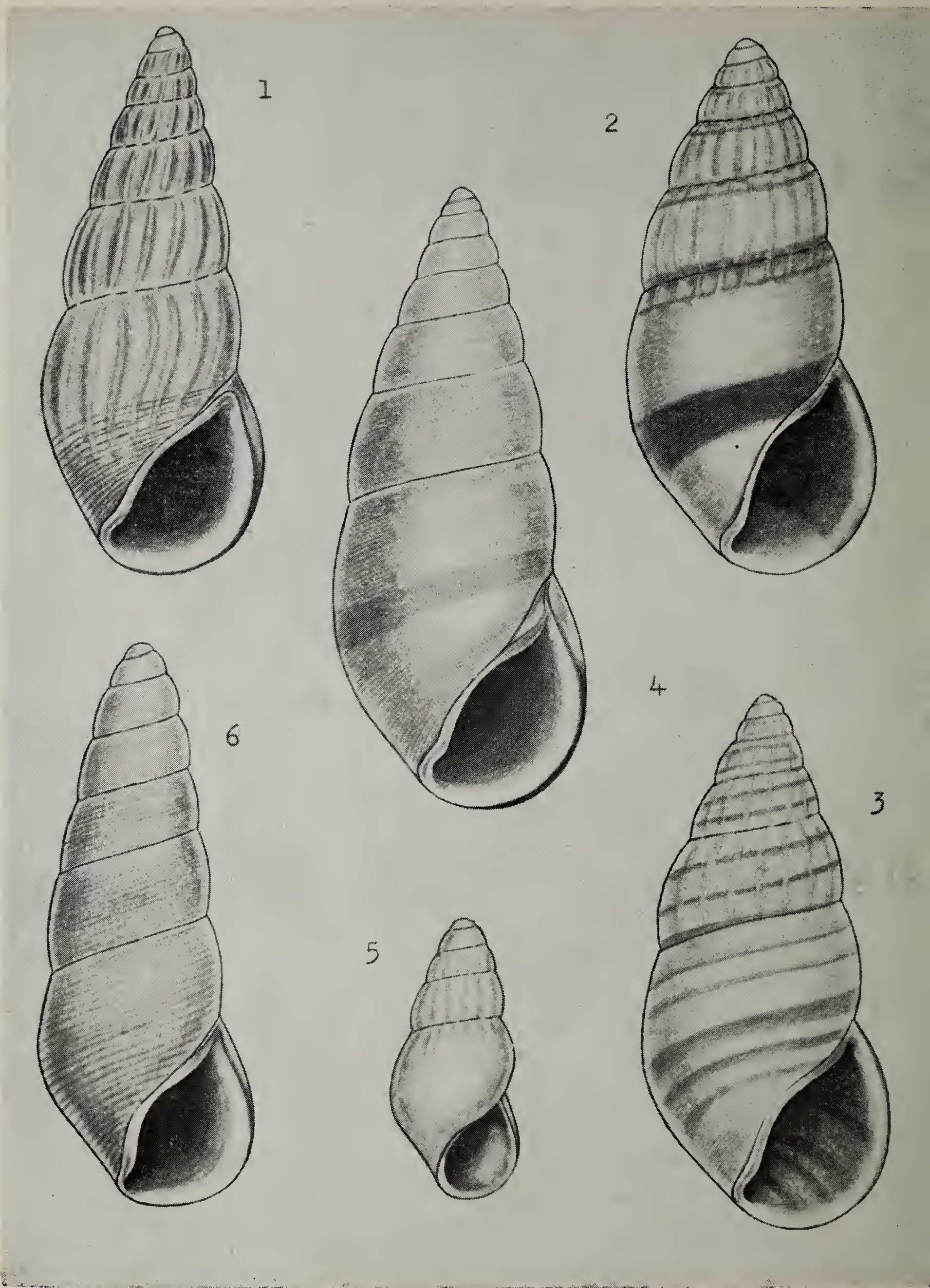
1804 *Anthochiton aereus* (Reeve 1847). S. 4; v.l.r.

Robsonella sp. Foveaux Strait.

1852 *Argonauta nodosa* (Solander 1786). Mason Bay.

Where South Cape is given as the locality, the specimen was obtained form a crayfish pot in 25-35 fathoms (unless otherwise stated). Most of the identifications have been made from descriptions and figures alone, and the *Cerithiidae* in particular need to be compared with the types. The list of land molluscs is based on Mr R. K. Dell's paper "The Land Mollusca of Stewart Island and Solander Island" (T.R.S.N.Z. Vol. 80, 136-156); but all localities given are additional to his.

Acknowledgment: I must thank Dr Pilgrim for help in naming the nudibranchs.



1. Rissoina chathamensis (Hutton, 1873)
2. & 3. Rissoina anguina Finlay, 1926
4. Rissoina zonata Suter, 1909
5. Rissoina rufolactea Suter, 190
6. Rissoina achatina Odhner,192
7. Rissoina fictor Finlay, 1930

THE GENUS RISSOINA.

d'Orbigny, 1840.

By A. K. HIPKINS.

THIS family, is once again of the smaller variety of shellfish to be found quite commonly alive on the underside of stones, from half to low tide, or washed ashore in hundreds. Those who have taken shell sand samples from northern beaches could not fail to have been enchanted by these tiny shells which possess a multitude of colour variations, more apparent in some species, but, in general, common within the genus.

Rissoina chathamensis (Hutton, 1873) is the most common and wide-spread species, ranging from Cape Maria, the northernmost tip of the North Island to Stewart Island, and also Chatham Islands in the south. Shell elongate, imperforate, solid costate. Sculpture consisting of oblique rounded ribs more prominent on the upper whorls, fading out toward the base. The distance between ribs seems to vary a little. Ribs numbering about fifteen to sixteen on penultimate whorl. Except for the protoconch of one and a half smooth whorls, the whole shell is very finely spirally lirate, not always noticeable in some specimens, spirals becoming more prominent on the base. Whorls seven and a half, slightly convex, suture impressed. Aperture oblique, ovate angled above, distinctly channelled below the columella. Peristome continuous much thickened usually white, columella very short, oblique. Colour usually creamy brown, sometimes with light rufous spiral bands similar to No. 3. Height 7.5 m.m. Diameter 2 m.m. Type, locality, Stewart Island. Illustrated specimen from Leigh, under stones, half to low tide.

Rissoina anguina, Finlay, 1926. This species in particular has a wide range of colour variation, either in alternate wide and narrow subsutural bands, usually with a wide band on the body whorl, or the whorls may be ornamented with oblique flashes of light brown. Shell stout, shining costate. Sculpture, narrow, slightly oblique axial ribs, about 24 per whorl, interstices 2-3 times as wide becoming obsolete on the body whorl. Except for the protoconch of one and a half smooth whorls, the shell has dense fine spiral grooving. Whorls six and a half, slightly convex. Spire about one and a half times height of aperture, Peristome continuous, not so much thickened as the previous species, aperture more angled. Height 5.5 m.m., diameter 2.5 m.m. type. Illustrated specimen from Leigh, in shell sand. (*Aupourian.*) Type locality presumed to be Whangaroa Harbour.

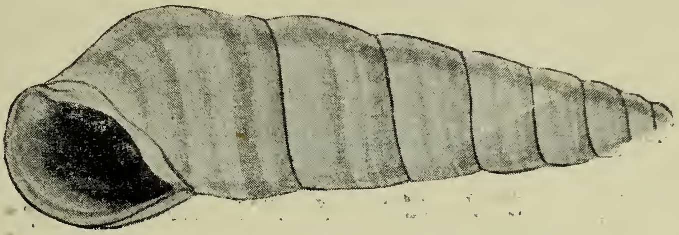
Rissoina zonata, Suter, 1908. Is the largest species in the family and quite a handsome shell. Shell tall solid, minutely spirally lirate. Protoconch of one and a half whorls, smooth, shining. Whorls 7½, lightly convex and somewhat flattened below the suture. Suture not much impressed. Spire high, about twice the height of aperture. Aperture oblique ovate, peristome continuous, round, much thickened where inner and outer lip are connected to body whorl, distinctly channelled below. Colour variable, usually dirty white, with a moderately wide brown band about the middle of the body whorl, this may occur on previous whorls also, or the shell may be light cream, with axial brown flashes above and below the sutures, broken by an intermediate narrow white zone. Height 10 m.m., diameter 4½ m.m. (Illustrated specimen, underside stones low water Te Kaha.) (*Aupourian, Cookian.*)

Note: Suter describes this species as having "somewhat indistinct axial ribs, 14 on the last whorl." Type specimens from the Bay of Islands are beach worn. I have not seen specimens which possess this ribbing, the material at my disposal was taken alive from two localities. Mr Powell remarks that "the so-called axial ribbing could be caused by intermittent growth lines or differential weathering.

Rissoina rufolactea, Suter, 1908. Shell small elongate imperforate, semitransparent, faintly shining. Protoconch of one and a half smooth domed whorls. Succeeding whorls axially costate, ribs thick, shallow, rounded, interstices of the same width, about 15 on the last whorl, fading out toward the periphery, base quite smooth, except for growth lines. Colour, of live specimens, protoconch and succeeding two whorls are a rufous colour fading on the body whorl, usually this is white, aperture white. Spire elevated, about twice the height of the aperture. Outlines straight. Whorls 5½ including the protoconch, whorls flatly convex, suture impressed. Aperture, oblique oval, angled above. Peristome, continuous slightly thickened, rather blunt at the edge, thin on the parietal wall, with a slightly expanded basal lip. Columella oblique thin almost straight. Type, Suter collection. Height 3.3 m.m., diameter 1.5 m.m., locality Hauraki Gulf (H.S.). Illustrated specimen from Tauranga, collected alive. (Aupourian, Cookian).

Rissoina achatina, Odhner, 1924. Shell elongate, imperforate, solid shining, with faint and obsolete axial sculpture, and fine sharp undulating spiral straie, indistinct on the base. Colour, pure white, or white with a brown design, in the shape of a row of stripes on a white band, below the suture often combines with fulgerating longitudinal lines, which may predominate; often the brown colour marking may be confluent into 1-2 brown bands leaving a white, subsutural line or zone; apex and base white. Spire about twice the height of aperture. Whorls 7 slightly convex the last somewhat more than half the shell height; suture slightly impressed. Protoconch papillate, of one, to one and a half smooth whorls. Aperture, oblique, semiovate, subcanaliculate below, angled above; external lip somewhat expanded at the middle. Columella excavated, obliquely truncate at the channel. Operculum elongate, ovate, horny, its inner margin, with a small projecting angle near the base, below the claviform process, which is situated at the third of operculum height. Height of shell 6.2 m.m. Diameter 2.2 type. Locality, North Channel, Kawau Island, one immature specimen, dredged 10fms; Moko Hinau Island, 5fms. In shape this species is similar to *R. zonata,* but resembles, to an even greater degree, *R. hanleyi,* an Australian species, which Suter illustrated and recorded as a N.Z. species in his Manual of N.Z. Mollusca p.219 Pl, 13, fig. 8. My illustrated specimen is evidently not quite adult, although possessing the same number of whorls as those of Odhner's. Height about 4.9 m.m., diameter 2 m.m. Dredged 18fms, N.E. side Stephenson's Island, about one and a half miles off Taupo Bay, Whangaroa. (Aupourian, Cookian.)

Rissoina ficta, Finlay, 1930. Shell very tall and slender, smooth except for spiral grooves. Embryo dome-shaped, milk white and glossy, of about two rather large whorls merging imperceptibly into the adult shell, tip somewhat flattened and inturned. Whorls about 5 practically flat. Spire acicular, very high for the genus, more than twice height of aperture, outlines straight. No axial sculpture. Dense and rather prominent spiral grooving covers whole surface. One narrow brown spiral band just above middle of whorls. Aperture as in *chathamensis,* but more sharply angled above and below. Height 5.6 m.m.; of aperture 1.7 m.m.; width 1.9 m.m. Type. Locality—38fms off Cuvier Island. Illustrated specimen from one of twenty dredged in 22fms N.W. side Stephenson's Island, about 3½ miles from Whangaroa. My specimens show faint axial growth lines very close together on all whorls, and as many as three colour bands on each whorl, but colouration or banding cannot be taken into account in this genus as it is subject to great variety. Height 6.3 m.m., diameter 2 m.m. Finlay's photograph of holotype shows seven whorls excluding the protoconch of about one and a half whorls.



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Acknowledgments:

The greater part of this article has been taken from the printed descriptions of the original authors of the species here mentioned. I express my greatful thanks to: Messrs N. W. Gardner, T. P. Warren, W. P. Thomson, who generously loaned or presented me with material for comparative purposes and illustration. Special thanks are due to Mr A. W. B. Powell, who once again gave, unstintingly, of his valuable time and knowledge in checking material.

References:

Suter H. Manual of N.Z. Mollusca.

Finlay, J. H. New Zealand Molluscan Systematics (Trans. N.Z. Inst., Vol. 57, p 379. 10th March, 1927.

Finlay, J. H. Additions to the Recent Molluscan Fauna of New Zealand No. 3 Trans. N.Z. Inst., Vol. 61 p 227, 29th November, 1930.

Odhner, N. H. New Zealand Mollusca. Papers Mortensen's Pacific Expedition No. 19 p 23.

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NOTES ON SMALL LAND SNAILS FOUND NEAR KAITAIA, NORTHLAND.

By L. PRICE.

THESE notes are based on intensive collecting within a radius of 20 miles of Kaitaia over the past 2 years.

Allodiscus dimorphus (Pfr). Common, in fallen nikau fronds and under rotten logs. Shells up to 10 m.m. are to be found.

Austrosuccinea archeyi (Powell). Very common in sand-dunes at Tokerau Beach, living on algae in grass.

Charopa anguicula (Reeve). Common, likes very damp spots in nikau fronds, both on the trunk and on the ground. A small, dark shell.

Charopa chrysaugeia (Webster). Common, in fallen nikau fronds. Very small, yellowish shell with fine ribs, only 2 m.m.

Charopa coma (Gray). Very common, likes damp situations, particularly nikau fronds, on the trunk and in rotten logs. Have also found this species very plentiful under stones in the foothills of Seaward Kaikouras, North Canterbury.

Delos coresia (Gray). Common, in fallen nikau fronds and amongst leaf-mould. Rather pretty shell, striped, yellow and red-brown.

Egestula transenna (Suter). Rare, lives in very damp spots in fallen nikau fronds and ponga stems. Looks very similar to *Charopa anguicula,* but easily distinguished by the strong spiral threads on the base.

Fectola irregularis (Suter). Uncommon, under nikau fronds and rotten wood. Quite a large shell for this genus, up to 4 m.m. There are also 3 or 4 other species found here, but they are rather difficult to identify.

Subfectola caputspinulae (Reeve). Common, under rotten wood and fallen nikau fronds. Shell is almost white with regular sharp riblets. Also have collected large specimens of this species under stones near Ashley Gorge, North Canterbury, where it is rather plentiful.

Flammulina cornea (Hutton). Rare, in nikau fronds on the grounds. The animal is bright orange-yellow with a dark stripe along each side of the neck. Shell pale brown, up to 7 m.m.

Flammulina costulata (Hutton). Very rare, in nikau fronds. A finely ribbed species with zig-zag brown lines on top.

Flammulina costulata parva Suter. Very rare, a minute shell, but very pretty under the microscope. Almost identical with the foregoing, but the dark brown pattern extends also over the base.

Flammulina pilsbryi Suter. Common, to be found in numbers crawling about the "bulge" of nikau palms after rain. Rather like a charopa in shape.

Gerontia cordelia (Hutton). Uncommon, mainly in nikau fronds on the trunk. Mottled with dark red on pale horn background. Rather more common in the far northern block in Astelia. Now Delougapia cordelia.

Hydrocena purchasi (Pfr.). Very common, on nikau fronds, specially during rain. One of our tiniest land shells, 1 m.m. when adult. Now Omphalorissa purchasi.

Laoma leimonias (Gray). Common, under dead leaves and fallen nikau fronds, specially amongst ferns. A distinctive, conical, shiny shell. Seems to be the only species of Laoma in these parts.

Liarea hochstetteri (Pfr.). Very common, under dead nikau fronds and in leafmould. Almost every specimen from around here has the very wide labial flange.

Liarea T. waipoua Powell. Common, same as for preceding and is often found in the same locality.

Liarea E. tessellata Powell. Uncommon, in leaf-mould and amongst stones. Sometimes these 3 species of Liarea are found in the same locality. (Okahu Valley, Larmer's Road.)

Mocella alloia Webster. Uncommon, in fallen nikau fronds. Like a tiny Charopa, but distinguished by having the protoconch strongly spiralled.

Mocella cogitata (Iredale). Uncommon, mostly under rotten wood, also in nikau fronds. Larger and paler in colour than M. alloia, whorls narrow and tightly coiled.

Murdochia cytora Gray. Common, likes very damp situations, under fallen nikau fronds, rotten logs and stones, specially amongst ferns. A small, squat shell with a dense coat of sharp bristles.

Murdochia fasciatum (Suter). Uncommon, under nikau fronds and rotten wood, a small shell with sharp, white riblets and rounded periphery. Have found it only in the Mangamuka Gorge, north side.

Murdochia pallida (Hutton). Common, in nikau fronds, specially on the trunk. This is the largest and commonest Murdochia hereabouts. There is another variety almost identical, but with a coat of sharp bristles directed upwards.

Murdochia torquillum (Suter). Uncommon, in nikau fronds in damp spots. A tiny, tall-spired shell with deep suture and rounded whorls.

Otoconcha dimidiata (Pfr.). Very rare hereabouts. In nikau fronds.

Phenacohelix ponsonbyi (Suter). Very common, in fallen nikau fronds.

Phenacohelix pilula (Reeve). Common, under rotten wood and in nikau fronds. Small, globula shell with sharp, straight riblets. Most of the specimens here are plain, golden brown, without any colour pattern.

Phrixgnathus cheesemani Suter. Uncommon, in nikau fronds and leaf-mould. Dome-shaped shell with a minute perforation and margined suture.

Phrixgnathus erigone (Gray). Uncommon, in fallen nikau fronds and leaf-mould. Small, conical shell, regularly banded on top, plain underneath.

Phrixgnathus fulguratus (Suter). Uncommon, in leaf-mould in rather dry conditions. Shiny shell narrowly banded with reddish-brown.

Phrixgnathus glabriusculus (Pfr.). Uncommon, in fallen nikau fronds and under rotten wood. Almost transparent, smooth and shiny.

Phrixgnathus larochei Powell. Common, in nikau fronds and leaf-mould. Looks rather like Laoma leimonias but easily distinguished by having concave outlines.

Phrixgnathus moellendorffi (Suter). Common, in nikau fronds and on the trunk, specially during rain. Shell is rather flat with a wide umbilicus, regularly striped with orange-brown.

Phrixgnathus spiralus Suter. Uncommon, in fallen nikau fronds. Shell with high riblets and moderately wide umbilicus. Strongly banded with zig-zag reddish lines.

Phrixgnathus sciadium (Pfr.). Common, in fallen nikau fronds and leaf-mould. A distinctive broad, dome-shaped shell with margined suture. (Very large specimens are to be found at Spirits Bay, Far North.)

Phrixgnathus trailli (Suter). Common, in leaf-mould and under rotten wood. A neat, smooth, glossy shell with a narrow umbilicus. There are also a number of other species of this genus which I have as yet to identify.

Ptychodon tau (Pfr.). Common, in very damp fallen nikau fronds. A dark, flat shell, one of the largest of this genus, up to 4 m.m. There is a variety found here which is very similar, but differs by having strongly sinuous ribs and very compressed whorls.

Ptychodon hectori (Suter). Very common, inside rotting nikau fronds on the trunk. A tiny, deep red-brown shell with strong riblets.

Ptychodon pseudoleioda (Suter). Common, under fallen nikau fronds, rotten wood and stones.

Serpho kivi (Gray). Very common, found living on the underside of kohekohe leaves at various heights. Shell pure white with dark purplish-brown streaks on top.

Suteria ide (Gray). Common, in very damp spots, under rotten wood and leaf-mould, amongst ponga fronds. A bristly shell. Also have specimens from Nelson and Canterbury which vary in colour. pattern and sculpture.

Thalassohelix ziczac (Gould). Common, in leaf-mould under tree-ferns and on rotten wood. The sole member of the genus about this district.

Therasia celinde (Gray). Uncommon, under rotten wood. Dark, reddish-brown shell with strong riblets produced into spines around the periphery. Now named Therasiella celinde.

Therasia tamora (Hutton). Common, in fallen nikau fronds, under stones and rotten wood. Very much like preceding species, but smaller and flatter, with much more elaborate spines. Now named Therasiella tamora.

Therasia traversi (E. A. Smith). Rare, under rotten wood. Quite a large shell, very prettily marked with fine, reddish zig-zag lines, umbilicus closed, up to 12 m.m.

Tornatellinops novoseelandica (Pfr.). Very rare, in nikau fronds. A tiny, cylindrical shell, almost colourless.

COMMENTS ON INTRODUCED LAND MOLLUSCS OF N.Z.

By L. W. STRATTON, Watford, England.

I WAS very interested to read in your 1955 Bulletin the paper by Mr H. E. Whitten on "Introduced Land Molluscs of New Zealand," as so many of the species are to be found in Britain, and some of yours undoubtedly hailed from this country. I should like, if I may, to make some comments on the species listed by Mr Whitten, not in any spirit of criticism, but as a matter of interest, and to add force to his aim (d). Also, I feel that an exchange of ideas is always profitable.

Vitrea crystallina (Muller). Quite likely to occur in New Zealand. It is widely distributed in Britain and may be easily distinguished by its clear transparency and the closeness of the whorls.

Testacella maugei (Ferussac). Is the least common of the three species of *Testacella* in Britain. The others are *T. naliotidea* Draparnaud and *T. scutulum* Sowerby. All three appear much stouter at the hinder end than in the front, and the small shell is quite obvious on the outside at the tail end. *T. maugei* is generally darker than the other two, being usually brownish speckled with black and paler at the sides; the others are a uniform yellowish colour. The distinguishing features are the arrangement of the lateral grooves. All three species are associated with gardens, where they feed entirely on worms. They seize the tail end and are drawn down the worm's hole where they consume it at leisure. Their powers of distention are amazing. These slugs can actually "pounce" on a worm. Bodies very dry.

Vallonia excentrica (Sterki). There is a good deal of difference of opinion in Europe as to whether this is a "good" species, or whether it is merely a form of *V. pulchella* (Muller). I am of the latter opinion. I have collected a great many and the two forms appear to merge into one another, and there are always some which cannot definitely be placed in either category. The third species, *V. costata* (Muller) is readily distinguished from the other two by the strong transverse ribs round the periphery.

Ceciliodes acicula (Muller). Shell very long and narrow. The animal is blind.

Cochlicopa lubrica (Muller). It would be interesting to see specimens of these, as a second species,*C. minima* (Siesmaschko) = *C. lubricella* (Stabile) has recently been separated. It is smaller than *C. lubrica* and the shell usually narrower, and often inhabits dryer situations, though they are found together.

Arion ater (Linneus). Typically black, though there are many colour variations. Some of the coloured forms in this country are *A. rufus* (L.).

Arion nortensis (Ferussac). Although there are several colour forms, the usual colouring is bluish-grey, nearly black on the back with paler sides. A diagnostic feature is the yellow to orange sole and the yellow and very sticky slime.

Arion hortensis (Ferussac). Although there are several colour *medius* (Normand). Generally yellowish-grey or dull white. Shield granulose and usually yellowish in front. Body tubercles short and prominent, surmounted by glandular spikes, giving it a prickly appearance, especially when at rest—hence its popular name, the hedgehog slug. Head region darker than the rest, sole yellowish, slime yellow.

Helicella caperata (Montagu). Usually there are several brown bands, often interrupted, below the periphery, otherwise as described. The var. *ornata is* generally more conical and is whitish, banded in dark brown, very like *H. virgata* (da Costa), but much smaller.

Helix aspersa (Muller). You seem luckier than we are over monstrosities; they are very rare here. The shell markings are very variable. I have over 40 sets, nearly all different. The pale form found by Mr Powell is a typical seaside form in this country, and approaches var. *exalbida*. In exposed coastal places we get a depauperate form, much weathered.

Oxychilus alliarius (Miller). The animal frequently smells strongly of garlic, hence its name. Apart from this it is often difficult to distinguish from young *cellarius*.

O. cellarius (Muller). I have never noticed a greenish tinge on the under side.

Milax gagates (Draparnaud). *Milax* sp. are generally associated with gardens in Britain, though they do occur wild. All are prominently keeled. *M. sowerbyi* (Ferussac), yellowish-brown with paler keel, sole creamy-yellow. Very dry for a slug.

M. gagates is much darker, almost black on the back, keel the same colour.

M. budapestensis (Hazay) is smaller, a rich brown colour. Diagnostic feature, black and white parti-coloured sole.

Agriolimax laevis (Muller). Nearly always found in wet places, almost amphibious. Very active and alert.

A. agrestis (L), so far found only in the Norfolk Broads, though until recently this name was given to

A. reticulatus (Muller). Ubiquitous in Britain and our greatest molluscan pest. Found in every sort of habitat. Is whitish to pale ochreous, reticulated with brown, somewhat keeled behind. It has a raised white ring round the breathing hole. Slime copious and milky white. Could this be your *arestis?*

Limax flavus L. Up to 100 c.m. long, dusky yellow colour, chiefly due to yellow body slim. Front of head tinged with green. The young have a distinct greenish hue.

Judging by Mr Hipkins' excellent figures, I should say that both species are correctly named. I hope you find some more.

Some time ago Mr Gardner sent me some shells which are almost certainly *Ketinella nitidula* (Draparnaud). It is a common shell in this country—one of the *Zonitidae*.

★

HOW I BECAME A SHELL COLLECTOR.

By L. SEAGER.

I HAVE been asked innumerable times, "How did you come to take up collecting shells?" Well, in the first place, I had a family of four under six years of age, so on holidays it was impossible to wander far from the camp. At that time we camped regularly at Whitianga, at the far end of Buffalo Beach, where shells abound. In 1934 I had the children down on the beach, and while looking among the shells washed up, was fortunate enough to find a pair of perfect, though dead, *Cantharidus opalus.* My curiosity was whetted, so on I went and that day collected a few *Phenatoma,* both *zealandica* and *novaezelandiae,* and some *Venustas punctulata.*

The following day I was keener than ever, and leaving my husband in charge of the children, I wandered further afield. Then I found a large washup of *Xenophalium pyrum,* all looking alike to my untrained eyes. Some were dead and some had a very smelly animal still in the shell. Later I found out that one or two were the rarer *X. collactea.*

My youngest, whose favourite sport at that time was making sandcastles with his little wooden spade, called out excitedly that he had hit something too hard to dig through, so I went to help, and feeling that it was not a rock, I carefully dug around with my hands and found a very large *Tonna haurakiensis.* Unfortunately the spade had made a slight hole, but otherwise it was perfect. I still have that shell, and prize it as being the beginning of my collection. From this I went on, and each year until 1941, when we went down to the Wellington province, we returned to the Whitianga beaches, and further shells were added to the collection.

During the 18 months we were in the Wellington area, we visited many beaches, and from Otaki, Waikanae and Mouterere collected a large number of *Venustas cunninghami,* and a few small shells.

Returning to Hamilton, we again visited the Whitianga beaches, where I was fortunate enough to see Mrs Stocker, who invited me to see her collection. Mrs Stocker suggested that I join the Section, and gave me the address of the secretary. In 1954 I became a keen member of the Section, and have collected further afield, and with much more knowledge. I am now, according to my husband, one of those people who do not look at the scenery, but walk around with head down, weather ignored, looking for further shells. I may add that since he found a *Poireiria zelandica,* at the Bay of Islands, he also walks with his head down.

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REMINISCENCES OF A PARYPHANTA SCOUT

By HARRY JOHNSTON.

ABOUT 19 years ago, while working as an engineer at Stuart and Chapman's timber mills at Ross, South Westland, a pleasantly situated township 20 miles south of Hokitika, I was handed a letter by the Mayor, Mr Osmers.

That letter, which has played an important part in my life, and helped N.Z. science to some extent, was from a conchologist, A. W. B. Powell, of the Auckland Institute and Museum, asking if someone could be persuaded to visit the crest of Mt. Greenland, close to Ross, to search for a snail named by him from a single empty shell, *Paryphanta rossiana.* I did the trip eventually, against the advice of the locals, as a dense fog prevailed. I was told

I was mad, but as expected, I was soon above the fog into brilliant sunshine, with a wonderful view of the snow-covered Southern Alps. After three hours of hard work following the directions given, "Paryphanta, how to locate, etc.," I started for home disappointed, but as a last effort turned over a small root—result, one live *P. rossiana.* There were plenty of collapsed broken shells, and I retrieved some fair examples. On my return the snail created a little stir and Mr Osmers asked to show it at the school. He later sent it on with the result that his name was entered as the collector. Later when two men arrived to investigate (Mr O'Connor and Mr Gourlay, I believe) they did not know to contact me. However, Mr Powell wrote a very enthusiastic letter and asked for further examples so that he could check the radula. I took a party up later, intending to try again, but after lunch I looked round and found only two of us left, the rest having started down a blind spur. We went after them to point out their error and it took a long time in the mountain scrub to fix that up. I did not get back up to the 3000ft crest.

After the *P. rossiana* find, a similar type of shell from Mt. Greenland's neighbour, Mt. Rangitoto (both are island mountains off the main ranges), was sent in by Geologist Wellman. Then Geologist Gage provided shells from Rewanui north of Greymouth; thus the name *P. rossiana gagei* was coined. Next was from Mt Tuhua, Lake Kaniere, collected by Mr Fletcher of the Auckland District, and so *P. rossiana fletcheri* was written in. Fragments which appeared to belong to a related species, were sent from the Reefton District, and I heard of others from Westland way, but none were brought in to me.

At the end of 1939 I had to abandon work, because of continued illness, and went up north for several years. In 1944 I returned south to Seddonville, which is 3½ miles from the sea and about 26 miles from Westport on a fertile flat with several small farms and about 50 houses. Population consists mainly of coalminers' families. Surveyed to carry a large population, but the coal was not so abundant as expected. Hills and ranges from 800 to nearly 5000ft encircle the flat. The Mokihinui River flows by and after the 1929 earthquake, a breakaway flood swept over the settlement—up to over 8ft at my place.

While at Ross, a brother sent me two live shells, which he got when out deerstalking in the ranges south of Seddonville. Mr Powell named it *P. lignaria rotella* on account of the coloured spiral banding high on the whorls. Then after my return to this valley, on an overland trip, at 800 to 11100ft, I found shells with reddish coloured bands and lines going spiraly as in *P. rotella,* but in this case they extended almost all over the shell. Mr Powell said, "A beautiful shell, am naming it in your honour, *P. L. johnstoni.*"

In 1947, Mr Powell and his family and Mr O'Connor spent a fortnight about here, including Karamea, for a few days. On their return, they had a quantity of shells from Glasseye Creek, the usual yellow ground colour in these being replaced by a brownish shade. They seemed worthy of a separate name and so *P. lignaria lusca* was named. Mr Powell also discovered a patch of hybrids, *unicolorata* and *lignaria,* at Sawyer's Creek-Mokihinui River junction, and we were getting puzzled especially as I had found some on the same side (north) a mile further up with plenty of brown or rufus in them instead of the plain yellowish colour of *unicolorata.* However everybody enjoyed themselves and Mrs Powell came with us to the top of the 900ft range where I had found a greenish shaded *P. lignaria.*

Next year, 1948, Mr Powell returned, this time in a hurry, with the Prouse cousins to go over more ground. While trying to locate shells which had formerly been found close to Millerton township, I had ventured about six miles further south along Mount William Range, and returning across a grassy flat I got the biggest thrill of all—pieces of shell of a most unexpected type. In an hour's search I got one whole dead shell, and word from Mr Powell said: "Harry, you got something this time. It looks almost like *P. rossiana* itself. I'll be down with the Prouses." And so four expectant men could be seen later tearing a patch of scrubby bush and tussock apart, but two days' hunting produced only nine live specimens—named *P. rossiana patrickensis* after a nearby creek.

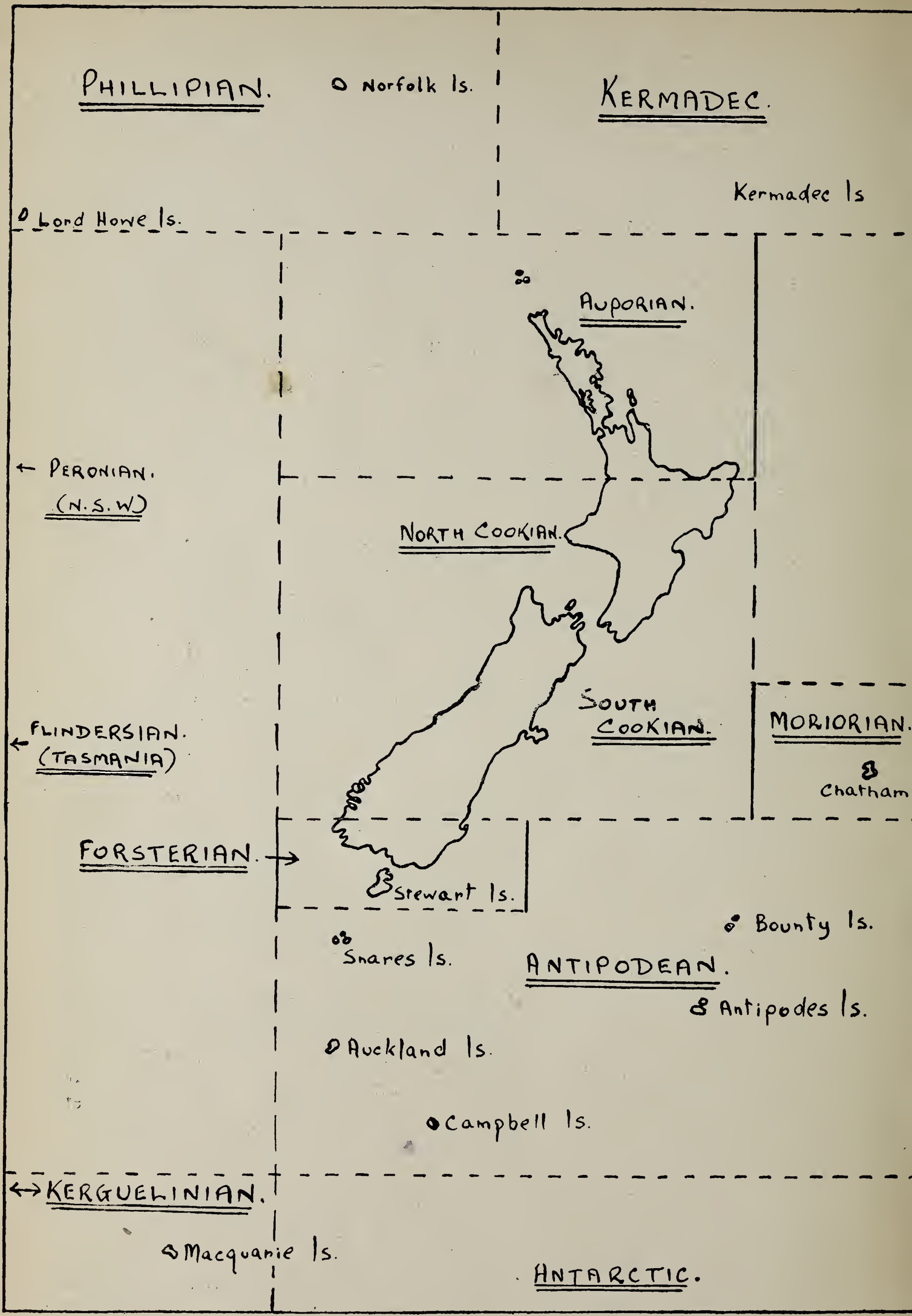
On a trip in the Denniston area I got some old collapsed shells near Mt. Rochfort at Waratea coalmine area. Dr Oliver had also been given some from here. They appeared to be *P. rossiana patrickensis.* Mr George Blake, of Nelson, found shells similar to these on Bald Hill ridge 60 miles west of Denniston, towards Murchison.

Whereas the *rossiana* series of shells are found only above 1800ft, *P. L. rotella* comes down to 450ft. I have also found them at 2000ft. P. L. johnstoni ranges 45ft at the river side to 1300ft or more. *P. lignaria* occurs from sea level to 1500ft, while subspecies *lusca* is found from a very low level to 3300ft.

Two of my other recent finds were also investigated, one at Ratcliffe Ridge at 1300ft, where a splendid wine coloured *P. L. johnstoni* exists, and another on the river side near the Mokihinui River mouth. The latter colony produced hybrids of *lignaria, unicolorata, rotella ruforadiata* and some true to type. By this time we had evidence enough to explain somewhat, the hybrids containing shell patterns from both sides of the river. I found earlier a *lignaria* floating apex downwards on a pool of water and later more, and then again on flood water near my home: therefore, as hybrids were nearly always found at river bends surely newcomers floated ashore and lived with the previous occupants. *P. unicolorata* was first recorded from Seddonville in 1900, collected by Clement Wragge.

A nephew brought me five good empty shells from about 20 miles inland on the north branch of the Mokihinui River, stating that there were plenty lying about. This Mr Powell named *P. lignaria ruforadiata.* I journeyed to the area with a deerstalker to check up and collect. We struck bad weather and little was done so I had arranged with him for another trip, but a week before the arranged date he did not return and some time after his body was found at Patea, 400 miles away in the North Island.

I have not been able to visit the *P. lignaria oconnori* area as it is difficult of access, eleven miles east of Karamea township, but geologist Wellman and his party sent in shells which they gathered. As a result of these trips I have acquired a wonderful knowledge of the country. I usually carry a home-made slasher with me to mark trees on my path just in case of a rescue party being needed. I have had no serious accidents, in spite of predictions. When alone every step I take is a careful one.


PHILLIPIAN.
Norfolk Is.
KERMADEC.
Kermadec Is
Lord Howe Is.
AUPORIAN.
← PERONIAN. (N.S.W.)
NORTH COOKIAN.
SOUTH COOKIAN.
MORIORIAN.
Chatham
← FLINDERSIAN. (TASMANIA)
FORSTERIAN. →
Stewart Is.
Bounty Is.
Snares Is.
ANTIPODEAN.
Antipodes Is.
Auckland Is.
Campbell Is.
↔ KERGUELINIAN.
Macquarie Is.
ANTARCTIC.

NEW ZEALAND MARINE FAUNAL PROVINCES.

By PHIL WARREN

THE accompanying figure is an attempt to define the approximate boundaries of our Marine Faunal Provinces together with outlying ones which have a definite bearing on our own.

I have not attempted to show the ocean currents as I have aimed at clarity and the figure would become overloaded were they shown. Those most affecting our fauna are the Notonectian, or East Australia Warm Water Current, which crosses the Tasman to disperse faunal elements in the Auporian and Cookian zones; and a current which flows northward from the Antarctic through the Antipodean, Moriorian and South Cookian areas. Certain coastal currents effectively aid the dispersal of many genera up and down the main islands and to some of the outlying ones as well.

★

SOME VARIATIONS IN THE SPECIES, CHAROPA COMA (GRAY).

By H. E. WHITTEN.

CHAROPA coma is a familiar snail to all collectors of N.Z. land molluscs. It may be found in most districts of the North Island and in parts of the South Island. An interesting form of the species also occurs on Stewart Island. In these notes attention is drawn to two characteristics of the species in which a certain amount of variation may be observed, viz. the spire elevation and the number of riblets.

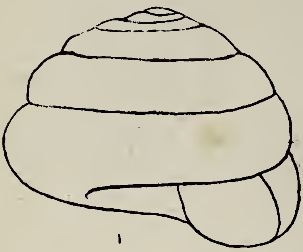
1. *Spire elevation.*

Typically *C. coma* has a depressed, rather flattened spire which rises very little above the body-whorl. The amount of elevation is, however, not constant and varies among individuals from the same locality. In most localities this variation is comparatively slight. Little difference in this respect may be seen, also between specimens gathered from widely separated localities. There are, however, two areas, at least, in which the elevation of the spire becomes more pronounced.

(a) Near Wellington this elevation reaches its greatest extent in the subspecies *C. coma globosa* (Suter). Although the spire height in this subspecies is not constant, specimens may be found quite commonly in which the height of the shell is little less than that of the major diameter. In this subspecies also, the elevation of the spire is accompanied by a slight decrease in the width of the umbilicus. Though typical *coma globosa* is quite distinct, individual specimens may be found around Wellington which show all intermediate stages between typical *coma coma* and true *coma globosa*. There does not appear to be any fixed dividing line between the two subspecies.

(b) An interesting form of *C. coma* has been collected by Mrs N. W. Gardner at Half Moon Bay, Stewart Island. Six specimens that I have examined are all reasonably consistent as to spire height, which is not as great as in *coma globosa,* but is more pronounced than is generally found in *coma coma.* If these specimens are typical of *C. coma* from that area, they would indicate a definite and distinct local form differing from those found elsewhere.

The accompanying figures show the comparative variations in spire elevation and differences in the general profile of these forms.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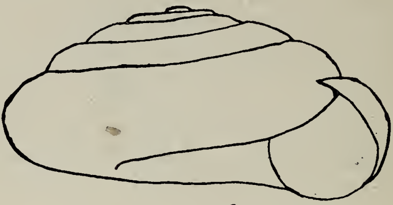
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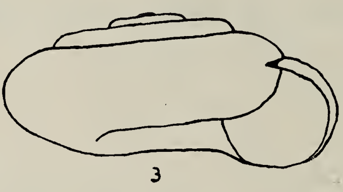
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Fig. 1. *Charopa coma globosa* — Days Bay, Wellington.
Fig. 2. *Charopa coma* — Half Moon Bay, Stewart Island.
Fig. 3. *Charopa coma coma* — Martins Bay, Mahurangi Peninsual.

2. *Number of Riblets.*

The major sculpture of *C. coma* consists of a number of oblique radial riblets. These are stated by Suter as being "about 2 per millimetre, but the number is very variable." (Manual p.705). The impression gained from reading this is that, despite the variable numbers, 2 per millimetre is a normal count. This would not appear to be so. An examination of specimens from several localities indicates that a count of riblets as few as 2 per millimetre is a rather rare occurrence and that normally there are more than this. However, the measuring of the number of riblets per millimetre is a rather difficult procedure with any small snail. The smaller the snail, the more difficult it is. I presume that Suter measured the riblets at their widest distance apart, i.e. on the periphery of the body-whorl. This necessitates measuring around a curved surface—a far from easy thing to do with small shells. With *C. coma* there is an added difficulty occasioned by the fact that in this species the riblets on any individual specimen are not evenly spaced, some being much closer together than others. A different number of riblets per millimetre could be counted on different parts of the periphery. A far more useful method of recording the riblets, especially for purposes of comparison between different individuals and with other species, is that suggested by Mr R. K. Dell (Dom.Mus.Rec Zool. vol. 1, No. 9, page 92). This method utilises the ratio between the total number of riblets on the body-whorl and the diameter of the shell. By dividing the total number of riblets by the major diameter of the shell in millimetres we obtain a riblet index (R.I.) for that shell. Working out the riblet indices for a number of shells gives us an accurate indication of the amount of variation in the number of riblets within the species, and by comparing these indices with those obtained for other species we have a useful method of comparing the different species.

Following are a number of localities from which I have examined specimens of *Charopa coma coma* and alongside of each is the range of riblet indices found in specimens from that locality. The mean riblet index for each locality is also given.

	Range of R.I.	Mean R.I.
Whangarei (16 specimens)	10-20	16
Leigh (10 specimens)	12-16	14
Martins Bay, Mahurangi Peninsula (40 specimens)	12-19	14
Titirangi, Auckland (14 specimens)	13-15	14
Te Mata, Coromandel Peninsula (18 specimens)	11-14	13
Motu River, Bay of Plenty (5 specimens	12-17	15
Levin (20 specimens)	12-18	15
Dyers Pass, near Christchurch (22 specimens)	14-18	16
Riccarton Bush, Christchurch (20 specimens)	14-19	17

It will be seen from these figures that in most localities there is considerable variation in the number of riblets amongst individuals from the one locality. The mean riblet index, however, does not show so much variation between the various localities. A larger series of specimens from each locality could alter the mean index a little but probably not very much.

An interesting comparison may be made with specimens of *C. coma globosa* from the following localities.

	Range of R.I.	Mean R.I.
Waikanae	10-13	11
Khandalla	10-12	11
Days Bay	9-14	12

These indices show that not only does *globosa* differ from typical *coma* in the spire height and width of umbilicus, but also in the number of riblets. For while the range of the riblet indices falls within the range of *coma coma* the mean index is much lower.

The specimens from Half Moon Bay referred to above show a riblet index range of 12-14, with a mean index of 13. In this respect also, then, they show themselves to be intermediate between typical *coma* and *coma globosa.*

Other species.

There are two other species of *Charopa* comparable in size and general appearance with *C. coma.*

(a) *Charopa multicostata* (Murdoch). Specimens of this species from the Motu River area (Bay of Plenty), show a range of riblet indices of 21-24, with a mean index of 23. The index here is clearly greater than in *C. coma*. *Multicostata* may also be distinguished from *coma* in having a noticeably wider umbilicus.

(b) *Charopa pseudocoma* (Suter). Topotypic specimens from Akaroa show a range of riblet indices of 18-20, with a mean index of 19. Although this range lies within that of *C. coma,* the mean index is greater than that found among specimens from any of the above localities for *coma*—although only slightly greater than the mean index of specimens from the two nearest localities, Dyers Pass and Riccarton Bush. *C. pseudocoma* may, however, be distinguished from *C. coma* in that the riblets of pseudocoma are finer and more regularly spaced than in *coma.*

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THE PAPER NAUTILUS.

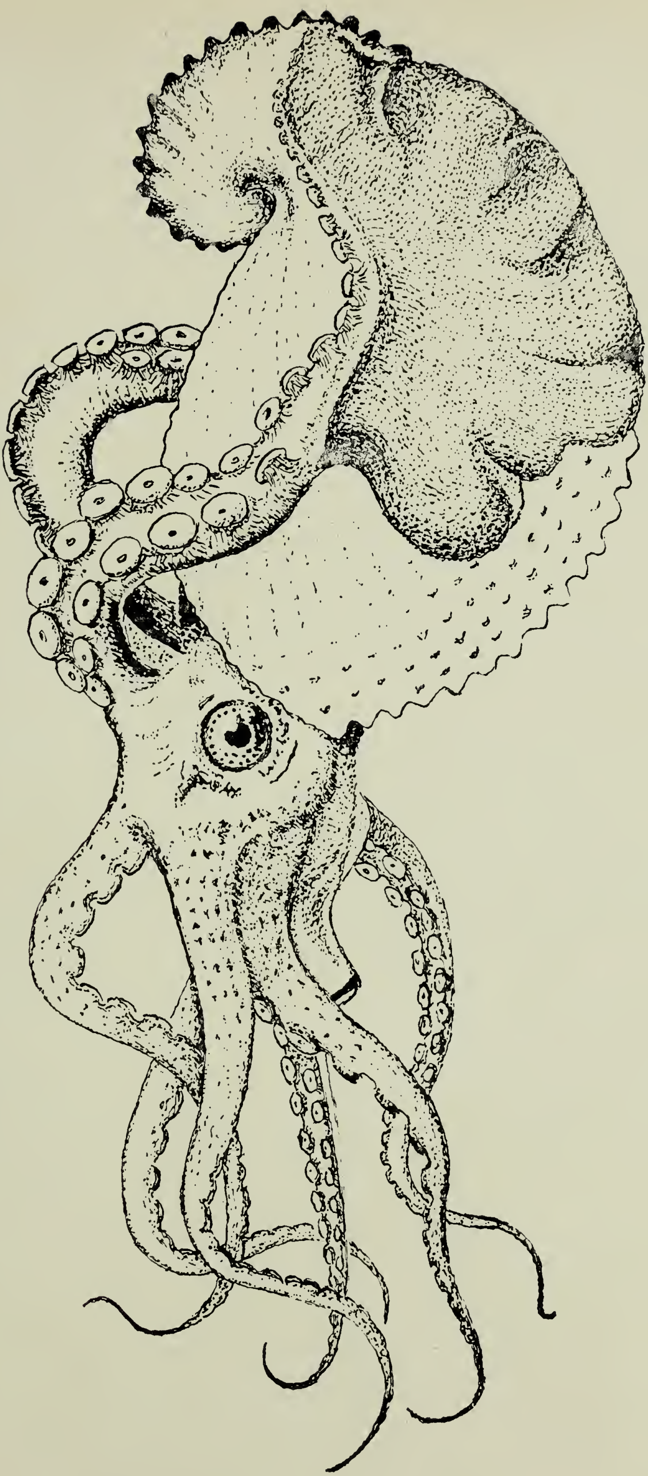
By ALBERT H. JONES

THE Nautilus lives almost entirely in the open ocean where ordinarily, the eggs would have little chance of survival. The female overcomes this problem by building the fragile shell which we know as the Paper Nautilus. In this she carries her eggs until they hatch out and the young are ready to leave the shell and fend for themselves

The male argonauta has no shell and is very seldom seen, being much smaller than the female—about one tenth the size of its mate.

The animal has eight arms, the dorsal or upper pair in the female are expanded at their extremities and are joined with fleshy membranes. It is these enlarged arms which secrete lime to build the shell, and they are also used to clasp the shell. The animal is not attached to the shell by muscles as is the case with most molluscs. Very little is known about the argonaut animal once the young have left the shell. It is unknown whether the shell is discarded and a new one build for the next breeding season, or if it is retained and enlarged as the animal grows. The shell with its free flowing lines and lack of all growth ridges would lend substance to the former view, though this seems a wasteful provision of nature. Also if thousands of shells are cast adrift after each breeding season, one would expect many more shells to be washed up on our coasts.

Shells containing the live animal and eggs sometimes come ashore in large numbers—more often on off-shore east coast islands. One such visitation was witnessed at Mayor Island in December, 1949, by Mr McFarlane and his son Athol, of Shore Road, Remuera, who were visiting the island at that time. A large number of shells containing live animals and eggs in various stages of development came inshore at Western Bay. Mr McFarlane estimated the number as being about 1000. Owing to calm weather and the absence of kingfish and other predatory fish that normally take a large toll of these shellfish, about 800 specimens were collected ranging in size from tiny shells of 1¼ins to others up to 6ins in length. Many others could be seen in several feet of water. It would appear from Mr McFarlane's description of the phenomenon, that the



Female argonauta clasping shell

animals came inshore with a set purpose; that was, to reach the shallower waters of the bay where the tiny animals, that were due to hatch out, would have the protection of small stones, rock pools and seaweed in which to hide from their natural enemies.

Apparently there were none coming inshore beyond the limits of Western Bay. About ten years ago a large number came ashore, also. Empty shells are washed ashore on occasions—the largest recorded specimen for N.Z. measures 10¼ins. This shell, a perfect specimen of *A. tuberculata,* was found near Kaipara Heads, and is housed in the Auckland War Memorial Museum. Another specimen, measuring 6½ins, now in Captain Short's collection, was collected at Parau Bay, Manakau Harbour.

Two named species are found in N.Z. waters: *A. tuberculata* (*A. nodosa*) and *A. argo.* (The two former shells are now considered to be the same species.) It is white, or in some specimens slightly cream coloured. The shell is covered with numerous ribs radiating outwards and broken by rows of small nodules following the spiral pattern, each rib finishing with a prominent nodule on the double keel. The earlier nodules are sepia, the colour gradually fading out as the shell grows in size. The shell known in the past as *A. nodosa,* follows the same pattern, but is distinguished by the upward curved lips where they join the body of the shell.

A. argo grows to about the same size, but is more finely ribbed and is much flatter, the keeled edges being ¼ to ¾-inch apart. The nodules on the keels are smaller and more numerous.

Both *A. nodosa* and *A. argo* are also found in Australian waters, also *A. hians* and *A. bottgeri.*.

A. nodosa is the best known species and appears to be the same as our shell of that name. It appears in large fleets on the open seas—often to be seen during spring and summer off the New South Wales coast. The animal is described by Miss Joyce Allan in "Australian Shells" as flesh-white, speckled with reddish brown to purple. The animal is a popular bait with Australian fishermen. Australia holds the record with a specimen measuring 10½ins. This shell was found in the Gulf of St. Vincent. South Australia and is housed in the Adelaide Museum.

A. hians is a small rounded shell growing to about 2ins, heavily ribbed, with each alternate rib finishing with a nodule on the keel. In colour, the shell is deep cream or light sepia.

A. bottgeri, a rare shell, is similar to the former, but has more numerous ribs, usually uniting in twos and threes halfway across the shell. The surface is finely granulated, and the nodules on the keel very prominent. The colour is a light brown, deeper on the first formed part of the shell. Grows to about 2ins.

A. argo, A. hians and *A. bottgeri* are also found in Japanese and adjacent island waters. There are two others, both small shells, found in these islands. *A. nouryi,* characterised by a long, shallow body whorl, is a finely ribbed deep cream shell growing to about 2ins. *A. grueneri,* another shell growing to about 2ins, has fine markings and small nodules and is brownish in colour.

A. argo is apparently found in American waters. W. F. Webb, in United States Mollusca, mentions this species as being found on the Florida coastline. Several fossil forms of Argonauta are known. One species occurs in the N.Z. Lower Pliocene.

COLLECTING NOTES FROM LEIGH.

By PHIL WARREN

IN the first place I'd like to state that collecting over the past year or two has not been so profitable here as in the past, for a variety of reasons. One in particular is that we seem to have had so many easterly gales that some former good haunts are now, alas, no more. Some beaches are now bare rock instead of sand and vice versa and it may be years before they return to normal. Another trouble observed at Goat Island Beach, in particular, is a by-product of the increased popularity of the place from a tourist point of view—to my alarm, I might add. This is the fact that so many amateur beach combers go to the beach and aimlessly turn over rocks and leave them upturned thereby killing most of the life underneath. This, in only a couple of years, has had an obviously adverse effect on the life at the beach. Such species as *Buccinulum,* once common, are now noticeably absent, as well as many other genera.

Te Rere Beach, which used to be a marvellous place for shell sand, is also a write-off at present owing to a large slip that came down the cliff in a storm and covered the sand almost completely. The residue is nearly all washed away now so I'm hoping it will merely be a matter of time before the place is back to normal. Just now the sand has an acute slope as a result of the last easterly as also has Pakiri Beach, so there won't be much washup for a while until the sand has rearranged itself and levelled off a bit. Te Rere is the only place where I have found *Thoristella carmesina,* and it was here that Ken Hipkins collected *Paraclanculus peccatus,* though we have since found them at Kempts Beach too.

About four years ago Ken and I found a small *Lasaea* living at high tide amongst barnacles, but had more or less forgotten about it. However, last Easter we decided to have another look for it and found it to be commonly distributed along the coast, living right in amongst the barnacles on high tidal rocks. With it were some nice clean *Rissellopsis varia* plus their eggs, which are a very dark green jelly-like mass. The *Rissellopsis* were congregated around the egg masses much the same as one finds *Lepsiella* and *Cominella* when they are laying eggs.

Easter, 1955, when Syd Hulme was up here, we counted about a hundred *Aplysia brunnea* in pools at Goat Island Beach. They were of all sizes, mostly about 150 m.m. This year only a few were seen, two big ones about 230 m.m. and about a dozen small ones, browsing on a short hairy seaweed. Two other Nudibranchs were seen, probably juvenile *Bursatella,* but I'm afraid neither Ken nor I are experts at slug identification, so we're still not sure. The same day we collected a dozen *Guildingia obtecta*—a *chiton* which appears to be rather uncommon on the East Coast though abundant on the West. Another interesting find was a hermit crab specimen of *Nassarius spiratus,* about three-quarters grown. I have previously found two here but both were juveniles.

Hermit crabs have also provided me with two juvenile *Fusus mestayerae,* both taken at Te Rere a couple of years ago. This species is mostly found north of the Bay of Islands, though it is recorded in Suters Manual (as *Pisania reticulata*) from Rangitoto.

At Goat Island Beach, last Easter, Ken found a small *Daphnella cancellata,* the first record for that locality. We have found this species to be not uncommon at times both at Leigh Harbour and Ti Point. Most times they are to be found in groups of a half-dozen or so under smallish rocks resting on muddy sand. From Ti Point I have collected the pretty little bivalve *Zemyllita stowei* living in similar situations. Near Ti Point wharf are some huge boulders surrounded by sand and here are to be found good specimens of *Glycymeris modesta* and *laticostata* washed ashore. The rare bivalve *Dos'nia maoriana* is found occasionally but does not occur so often as formerly. Here, too, I found 3 live specimens of *Phenatoma novaezelandiae* after a storm last year, the first live ones I've collected myself. Up on the boulders themselves are very good *Zediloma atrovirens* and *Notoacmea pileopsis.* Both get plenty of shade so reach a good size without becoming eroded.

On barnacle covered rocks near Goat Island the subspecies *Notoacmea pileopsis cellanoides* is common. Owing to the roughness of the rocks the shell often takes of shape of the piece it lives on, and being exposed to all weathers it is nearly always eroded. Only in sheltered crevices does one find nice clean specimens. We recently collected some large *Melarhaphe oliveri* about eight to ten m.m. in height. *Melarhaphe cincta* is sometimes found too, but is decidedly rare here and always eroded and shabby.

We recently found a patch of soft papa boulders which yielded good specimens of *Anisodiloma lugibris* and *Atalacmea fragilis.* These two species nearly always occur together, I have noticed. Further up the beach I have seen *Zediloma digna* swarming on rotting seaweed in amongst the rocks, nearly always in the winter. I have a couple of *Z. digna* which are a bright reddish purple colour, rather reminiscent of *Cantharidus coruscans* from the sub-Antarctic. Another interesting colour variant has been seen in *Anisodiloma lugubris,* a specimen in my collection being a bright brick-red. This one was washed up on Goat Island Beach in 1949. Dr H. J. Finlay has written on the finding of albino specimens in T.N.Z.I., Vol. 60.

From Leigh Harbour I have found, alive in the mud, a variation of *Alcithoe arabica* which is practically smooth and this, together with a fairly tall spire, gives the specimens a strong resemblance to *A. swainsoni.* They are invariably covered with the blackish coating so typical of *Alcithoe* from muddy localities. Recent interesting records from the harbour are living *Philine auriformis* and *Baryspira novaezelandiae* in sandy mud at low water; and a nice example of *Cabestana waterhousei segregata* taken by Mrs Seager in March, 1955. An occasional specimen of *Murexsul octo-*

gonus is still to be found, but they are not so common as they used to be. It is interesting to examine live specimens of *Daphnella cancellata*—most seem to contain a parasitic worm rather like an attenuated grass grub. Three-quarters of the live ones I have seen contain this parasite. At first I thought it was the egg case, but examination under the microscope proves it to be some sort of worm-like creature. The animal of *Daphnella* is pure white with prominent dark brown eyes on the tentacles. Specimens placed in a dish of water are usually quite active for a while. I put some with some *Neoguraleus* under the microscope to watch their movements and to my great surprise I found the *Neoguraleus* each had an operculum—previously I had thought the operculum was absent in this genus. It seems to me that we have yet a long way to go before we know all there is to be known about our different shells.

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Non-Marine Mollusca of the Thames District

By H. E. WHITTEN.

THE FIRST published list of non-marine molluscs from the Thames was that of Adams (1886). In this paper he recorded 42 land and 9 fresh water species. Some of these species, however, have since been united with others on his list. According to our present recognition of specific limits the number of species recorded on that occasion by Adams is reduced to 36 land and 7 fresh water species.

Suter (1913), cited Thames as a locality for 34 land species. He did not record any fresh water molluscs as from Thames. For the most part Suter's Thames records were based on those of Adams, though he omitted this locality for some of the species included by Adams. Suter, however, cited Thames as a locality for 8 species not recorded by Adams.

During the past four years I have visited the Thames area on several occasions and have made collections of snails from several of the valleys which run from the central dividing ridge down to the east coast of the Peninsula between the Kaueranga river and the Waikawau stream. My most intensive collecting (on eight occasions), has been done in the Te Mata valley. Other collections have been made from the following valleys — Waikawau, Tapu, Puru, Karaka (behind the township of Thames), and Kaueranga.

As a result I have collected a total of 55 land and 5 fresh water species. Of these 23 and 2 species respectively were not recorded by Adams or Suter. While it is likely that a few other species may yet occur in the area, especially in the heavily bushed ridges, for the most part very difficult of access, behind the coastal valleys, the following list may be taken as representative of the molluscan fauna of the area as described above. The symbols used in the following list signify as follows:

A. — recorded by Adams (1886).
S. — recorded by Suter (1913).
W. — collected by myself.
1. — Te Mata valley, various dates between May, 1953 and May, 1957.
2. — Waikawau valley, May 5, 1953.
3. — Tapu valley, December 28, 1954.
4. — Puru valley, December 29, 1955
5. — Karaka valley, January 1, 1956.
6. — Kaueranga valley, May 13, 1957.

Land:

Omphalorissa purchasi (Pfeiffer) W. 1.
Cytora cytora (Gray) W. 3, 5.
Cytora hedleyi (Suter) W. 1, 6.
Cytora torquilla (Suter) W. 1, 6.
Liarea egea (Gray) W. 1, 2.
Otoconcha dimidiata (Pfeiffer) A. S. W. 1.
Thalassohelix zelandiae (Gray) A. W. 1.
Thalassohelix ziczag (Gould) A.
Allodiscus dimorphus (Pfeiffer) A. S.
Allodiscus granum (Pfeiffer) W. 1, 6.
Allodiscus planulatus (Hutton) A. S.
Allodiscus rusticus (Suter) S.
Allodiscus tullia (Gray) S.

Allodiscus urquarti (Suter) W. 1, 6.
Serpho kivi (Gray) A. S. W. 1, 2, 3, 5.
Therasia decidua (Pfeiffer) S. W. 1, 2, 3, 5.
Therasia traversi (E. A. Smith) W. 1.
Therasiella celinde (Gray) A. S. W. 1, 3, 5, 6.
Therasiella tamora (Hutton) A. W. 1, 3.
Phenacohelix ponsonbyi (Suter) A. W. 1, 2, 3, 4, 5, 6.
Phenacohelix chordata (Pfeiffer) W. 1, 2.
Suteria ide (Gray) A. S. W. 1, 4.
Flammulina chiron (Gray) A. S. W. 2, 5.
Flammulina cornea (Hutton) A. W. 1.
Flammulina costulata (Hutton) A. S. W. 1, 5.
Flammulina crebriflammis (Pfeiffer) W. 1, 2.
Flammulina cf. olivacea (Suter) W. 6.
Flammulina perdita (Hutton) A. S. W. 1, 5, 6.
Ptychodon tau (Pfeiffer) A. S. W. 1, 2.
Ptychodon varicosa (Pfeiffer) W. 1, 3.
Ptychodon pseudoleiodon (Suter) S. W. 1, 6.
Aeschrodomus stipulata (Reeve) A. S.
Charopa anguicula (Reeve) A. W. 3.
Charopa bianca (Hutton) A. S.
Charopa coma (Gray) A. W. 1, 2, 4.
Charopa montivaga (Suter) W. 1.
Fectola buccinella (Reeve) A. S. W. 1.
Fectola roseveari (Suter) W. 1.
Fectola tapirina (Hutton) A. S.
Subfectola caputspinulae (Reeve) A. W. 1, 6.
Mocella? alloia (Webster) W. 4.
Mocella cogitata (Iredale) A. S. W. 1, 4, 6.
Cavellia biconcava (Pfeiffer) A.S.
Geminoropa (*Cavelliorops*) *microrhina* (Suter) W. 1, 3, 6.
Laoma leimonias (Gray) A. S. W. 1, 3.
Laoma marina (Hutton) A. S. W. 1, 2, 3, 4, 5, 6.
Laoma poecilosticta (Pfeiffer) A. S. W. 1, 2.
Phrixgnathus mariae (Gray) A. S. W. 4.
Phrixgnathus ariel (Hutton) S. W. 1.
Phrixgnathus conella (Pfeiffer) A. S. W. 1, 2, 3, 5, 6.
Phrixgnathus celia (Hutton) A. S.
Phrixgnathus erigone (Gray) A. S. W. 1, 2, 3, 4, 5, 6.
Phrixgnathus glabriusculus (Pfeiffer) S. W. 1.
Phrixgnathus moellendorffi (Suter) W. 1.
Phrixgnathus regularis (Pfeiffer) A. S.
Phrixgnathus transitans (Suter) S.
Phrixgnathus n. spec. (*a*) W. 3, 6.
Phrixgnathus n. spec. (*b*) W. 1.
Paralaoma allochroida (Suter W. 6.
Paralaoma lateumbilicata (Suter) W.6.
Tornatellinops novoseelandica (Pfeiffer) A. S. W. 1.
Rhytida greenwoodi (Gray) A. W. 1, 2.
Rhytida dunniae (Gray) S.

Delos coresia (Gray) A. W. 1, 2, 4, 6.
Delos jeffreysiana (Pfeiffer) A. W. 5.
Athoracophorus bitentaculatus bitentaculatus (Q. and G.) A. S. W. 1, 3.
Athoracophorus bitentaculatus rufovenosus (Suter) W.6.

Fresh Water:

Hyridella menziesi (Gray) W.
Pisidium novaezelandiae (Prime) A.
Potamopyrgus antipodum (Gray) A. W.
Potamopyrgus corolla (Gould) A. W.
Potamopyrgus spelaeus pupoides (Hutton) A. W.
Simlimnaea tomentosa (Pfeiffer) A.
Physastra variabilis (Gray) A.
Planorbis corinna (Gray) A.
Latia neritoides (Gray) W.

Totals—Land:	67 species
Fresh Water:	9 species.
	76 species.

NOTES:

Cytora torquilla (Suter): The specimens from the two localities mentioned above are somewhat larger than specimens found nearer to Auckland and exceed the dimensions given in Suter.

Liarea egea (Gray): Specimens from this area are smaller than those from near Whitianga on the west coast of the peninsula. The hydrophanous pattern is scarcely developed at all.

Phenacohelix ponsonbyi (Suter): As I mentioned in a note in Bulletin No. 10 (1954) albino specimens occur with typically coloured ones in the Te Mata valley.

Flammulina cornea (Hutton): In Bulletin No. 10, I recorded the finding of one specimen of this rare species in the Te Mata valley. Since then I have collected three other specimens from the same locality.

Flammulina cf. olivacea (Suter): A single specimen, not quite adult, in leaf mould from the Kaueranga Valley, agrees with Suter's description of *olivacea*, except that the colour is dark brown and the spirals are visible over the whole of the shell.

Ptychodon pseudoleioda (Suter): Albino specimens occur with the normal colour form in the Kaueranga valley.

Mocella? alloia (Webster): One specimen only was obtained. It is a dead, partially bleached and slightly damaged shell, but seems to agree closely with the description of this species.

Mocella cogitata (Iredale): The specimens include both the typical form and also a form close to Suter's var *maculata*

Laoma marina (Hutton): Amongst a large number of specimens of this species taken in the Kaueranga valley was one very beautiful specimen. It is completely colourless and has the appearance of being finely cut from crystal

Phrixgnathus n. sp. (*a*): This would seem to be closest to *microreticulatus* Suter. It is small, dark, olive in colour, with pronounced, but very fine, reticulated radial and spiral sculpture. I have collected the same form in foliage beatings from the following localities also – Near Swanson, the Huia Valley, and beside the road at the summit of the Kaimai hills.

Phrixgnathus n. sp. (*b*): This has a depressed pale horny shell with darker radial markings and is crossed with membranous radial riblets. It seems nearest to *phrynia* Hutton but differs from that species in several aspects. I have collected a similar form also at Titirangi.

Rhytida dunniae (Gray): Suter cites Thames as the southern limit of this species. I have not seen it in the area, but I understand that it has been collected behind Thornton's Bay, near Puru, in recent years.

From the list given here it is apparent that the species found in this area are for the most part similar to those found in the Auckland area. Some species, however, which are common nearer Auckland are absent from this list. e.g. *Cytora pallida* (Hutton). *Liarea hochstetteri carinella* (Pfeiffer) and *Phenacohelix pilula* (Reeve). (Adams did include *P. pilula* in his list, but this was not Reeve's species *P. pilula* of Adams list = *ponsonbyi* Suter). On the other hand, the above list includes some species which are not found further north but which are common to the south, viz. *Flammulina crebriflammis* (Pfeiffer), which ranges from the Thames and Waikato districts southwards; *Aeschrodomus stipulata* (Reeve), which is rare in the North Island, but common in Otago (it has been found also in the Waikato); and *Phrixgnathus regularis* (Pfeiffer), which is known from a few scattered localities in the North Island but is more common in the South Island.

One species only is apparently endemic to the Thames area. It is *Allodiscus rusticus* Suter. I have not found this species.

INTRODUCED SPECIES:

The following introduced land molluscs have also been found in the area:

Pupilla muscorum (Muller).
Helix (*Cornu*) *aspersa* Muller.
Helicella (*Candidula*) *caperata* (Montagu).
Oxychilus cellarius (Muller).
Arion hortensis (Ferussac).

Literature:

ADAMS, James: "The Land Mollusca of the Thames Goldfields." Trans. N.Z. Inst. Vol. XIX, pp. 177 – 181 (1886).

SUTER, Henry: "Manual of the New Zealand Mollusca" (1913).

Collecting Shells in Dutch New Guinea

By A. W. B. POWELL

From mid-January to March, 1956, I was the guest of Mr A. J. Ostheimer on an oceanographic expedition to Dutch New Guinea, sponsored by Mr Ostheimer for the Academy of Natural Sciences of Philadelphia.

The vessel was the "Gloria-Maris," a 67-ton steel schooner of 105 feet in length and the area covered was Geelvink Bay which forms the "back of the neck" of the "New Guinea Bird" but the term bay is something of an understatement since its greatest width is almost 200 miles and it runs in for approximately 170 miles.

Across the entrance lie the Schouten Islands comprising the practically joined high islands of Biak and Soepiori with a combined length of 75 miles. Further in and to the east lies the even larger high island of Japen, with a length of 115 miles.

Collecting was done at many localities in these three large islands and also in the atolls of Mios Woendi and Padeaido to the north east and Mios Aoeri in the south-west area of the Bay.

Collecting methods covered shore collecting, wading and use of glass bottomed water boxes, swimming and diving with water goggles and face masks, dredging with conical and naturalist dredges and some aqua lung diving to a depth of about twelve fathoms by the captain and mate of the vessel.

The most successful collecting was invariably done at night by wading over the extensive coral sand flats using lights. Flats that seemed almost devoid of life by day yielded rich harvests at night.

Shells taken commonly at night were *Cypraea tigris* which has an elaborately frilled and filamented colourful mantle, *Cymbiola vespertilio*, the bat's-wing volute and *Mitra mitra*, that most colourful shell with its striking pattern of large vermilion spots.

By day the *tigris* could be taken only by deep diving and the Mitras were buried in sand in about five to seven feet of water.

The Mitras, olives and several species of *Cerithium*, were all sand dwellers and one soon learned to recognise their trails in the sand. The former made inch wide trails that sometimes went a hundred yards or more and only a tell tale slight hump in the sand showed which end of the trail to investigate.

At night another common find was the beautiful *Conus marmoreus* with its bold black and white pattern. It was always away from any cover on clean sand as also was the very large many spotted *Conus millepunctatus*.

The strombs, *Strombus lentiginosus*, *Conomurex luhuanus* and *Oostrombus gibberulus* were very abundant on the coral sand flats also but more often in areas where there was a sparse growth of a large form of *Zostera* algae.

Some very strange habitats were revealed after much searching. The large rounded clumps of the coral, *Porites*, for instance, often contained the Pectinid *Pedum* which is a rare shell in collections simply because most people do not know where to look for it.

Strangest of all was a small divaricately ridged bivalve that occurred towards high water under worn coral blocks in contact with sand in gutters where there was continual seepage. This shell proved to be the Galeommid *Pythina deshaysiana*.

At Sowek, Soepiori Island, natives brought us a few *Tectarius pagodus* of large size, almost three inches in height and it seemed certain that they had just got them on a small coral islet no more than 50 yards in circumference. I searched this islet from high water mark to below tide without result and then to my amazement upon glancing up the overhanging coral cliff there they were among the gnarled roots of trees hardly distinguishable from knots.

The native name for a land snail sounded like "biah" and this word was much used by us in an endeavour to get the natives to collect snails for us.

More often than not they brought us a species of *Neritina* known as *Neritodryas cornea* which is thin shelled and looks something like our old enemy of the gardener, *Helix aspersa*.

Neritinas are mostly fresh water with a few species favouring brackish water but much searching by us failed to locate the *Neritodryas* until one day some miles inland up a fresh-water river I went in search of land snails. Many of the snails are arborial and you locate them silhouetted against the sky on the under sides of leaves ten to twenty or more feet from the ground.

The usual species collected in this way were a keeled *Papuina* and the gloriously colour banded *Xesta citrina* but on this particular occasion the catch proved to be the elusive *Neritodryas*, fifteen or more feet up the trees and some distance from the river. A clear case of fresh-water snail, a member of a predominantly marine group that is fast changing its habitat to a terrestrial one.

The mangrove fauna was a spectacular one with the large cerithid *Telescopium*, 3 to 4 inches in height and the even larger ellobid, *Ellobium aurismidae* which looks like a giant relative of our tiny *Ophicardelus*.

Another member of the mangrove association was a large *Geloina* (*Cyrena*), a bivalve with a dark green epidermis.

Dredging on the whole was not very successful owing to extensive areas of uneven coral strewn bottom. Best results were obtained from six to ten fathoms on fine coral sand in the atolls and also in 100 to 250 fathoms on fine silts out of depth range of the coral.

The latter yielded a cold water type of fauna with *Nuculana* and *Cuspidaria*.

The few attempted casts of the dredge in 30 to 50 fathoms invariably brought up masses of coral sand and debris but usually at some cost to the dredge which went down rectangularly shaped and came up more or less a battered circle. We were fortunate in that only one of the four dredges was lost although many fathoms of wire went with it.

Six members of the expedition were out constantly collecting by day and often by night, augmented at times by the captain, mate and native crew of Palau Island boys. In addition we induced the local natives to collect for us in exchange for soap, sweets, tobacco and other goods.

All this resulted in a great bulk of material which should be very representative of the area.

The collections were all forwaded to Philadelphia where they have now been roughly sorted and the Auckland Museum quota, a very generous allocation of 560 species lots arrived, recently packed in seven very large cartons.

The collection is especially rich in unusual species of bivalves many of which are characteristic of the Indian Ocean but not of the islands of the Western Pacific.

Review

A new scientific journal entirely devoted to Australian Mollusca was born on Friday, September 13.

JOURNAL OF THE MALACOLOGICAL SOCIETY
OF AUSTRALIA, No. 1.
13th September, 1957. Published by the Malacological
Society of Australia, obtainable from the Secretary, 351
Glenferrie Road, Malvern, Melbourne. Price per copy,
15/- plus postage (12/6 plus postage to members).

This first number of 52 pages contains eleven papers, two of which give descriptions of new species. The quality and method of presentation of all the papers conforms with the best standards, the paper is good, the printing of excellent quality and it is well illustrated.

Miss Joyce Allan contributes on opisthobranchia new to Australia and another paper by Mr Robert Burn modestly entitled "On Some Opisthobranchia from Victoria" covers detailed descriptions, and field notes for thirty-five species, eleven of which are new to science and in addition a new genus is proposed. A new Queensland Volute is described by Professor J. M. Ostergood and Roy Summers.

Existing Victorian beds of the bivalve *Anadara trapezia* are described by Mrs R. J. Plant. Other interesting papers are by Mrs Thelma Hartley, Professor L. A. W. C. Venmans (Netherlands), Mr Robert Talmadge (California), Messrs. Bernard C. Cotton and Ron C. Kershaw.

A note of sadness enters into this otherwise joyous event of the birth of this new publication for we read with profound regret of the passing of a very well known and esteemed Sydney conchologist, Mrs Leone Wollacott.

New Zealand conchologists should not overlook this journal, in fact it is a "must" for already in this very first issue two of the papers at least have a bearing upon the New Zealand fauna.

If the quality of this first number is maintained and there is every prospect that it will be, then we look forward to many important contributions to the Australian molluscan fauna over the ensuing years.

In conclusion I note the bold challenge to superstition in the selection of the publication date.

A. W. B. POWELL.

The Genus Rissoina.

d'Orbigny (continued)

By A. K. HIPKINS

In my article in last year's Bulletin (No. 12), on some of the species in this genus, and in that on the genus *Scrobs* in Bulletin No. 11, I attempted, for the convenience of collectors, to give descriptions of the species dealt with, several of which were originally described in publications not easily obtained by New Zealand collectors. Along with these descriptions I supplied new figures of the species concerned. In many cases the original figures were not satisfactory.

In this present article on the remaining species in the genus *Rissoina*, I have followed the same plan. Three of the species dealt with here were described by the late Dr. H. J. Finlay. Of these, two were illustrated with poor photographs, while the third, *Rissoina larochei*, was not figured at all. For each of these three species I here give illustrations of the holotype.

Rissoina powelli Finlay, 1930 (Fig. 1). "Shell moderately large for the genus, with weak axial sculpture, polished and shining. Embryo dome-shaped, milk-white and glossy, of about two rather large whorls, merging imperceptibly into adult shell, tip somewhat flattened and inturned. Whorls 6, sides straight, except for a slight bulge just at suture, spire straight. Axials normally about 16 per whorl, but generally irregularly developed, becoming numerous and subobsolete on body whorl, merely very low raised ridges, 1½ times their width apart, somewhat like those of *anguina* Finlay, but a little coarser, extending in almost straight lines from suture to suture and vanishing below periphery on body whorl. Surface apparently quite smooth and shining, but irregular spiral scratches are visible under a high power, more regular and distinct on base. Colour uniformly greyish white. Aperture as in *chathamensis*, but more open.

Height, 8 mm.; width, 3.5 mm. (Holotype).
Height, 7.9mm.; width, 3.5 mm. (Holotype).
Locality — 60 fathoms off Poor Knights Islands, numerous specimens, Holotype in the Auckland Museum (Finlay collection).

Very like a *Zebina* with axial scultpure, but lacking the apertural denticles of this genus. A more Eulimoid aspect than

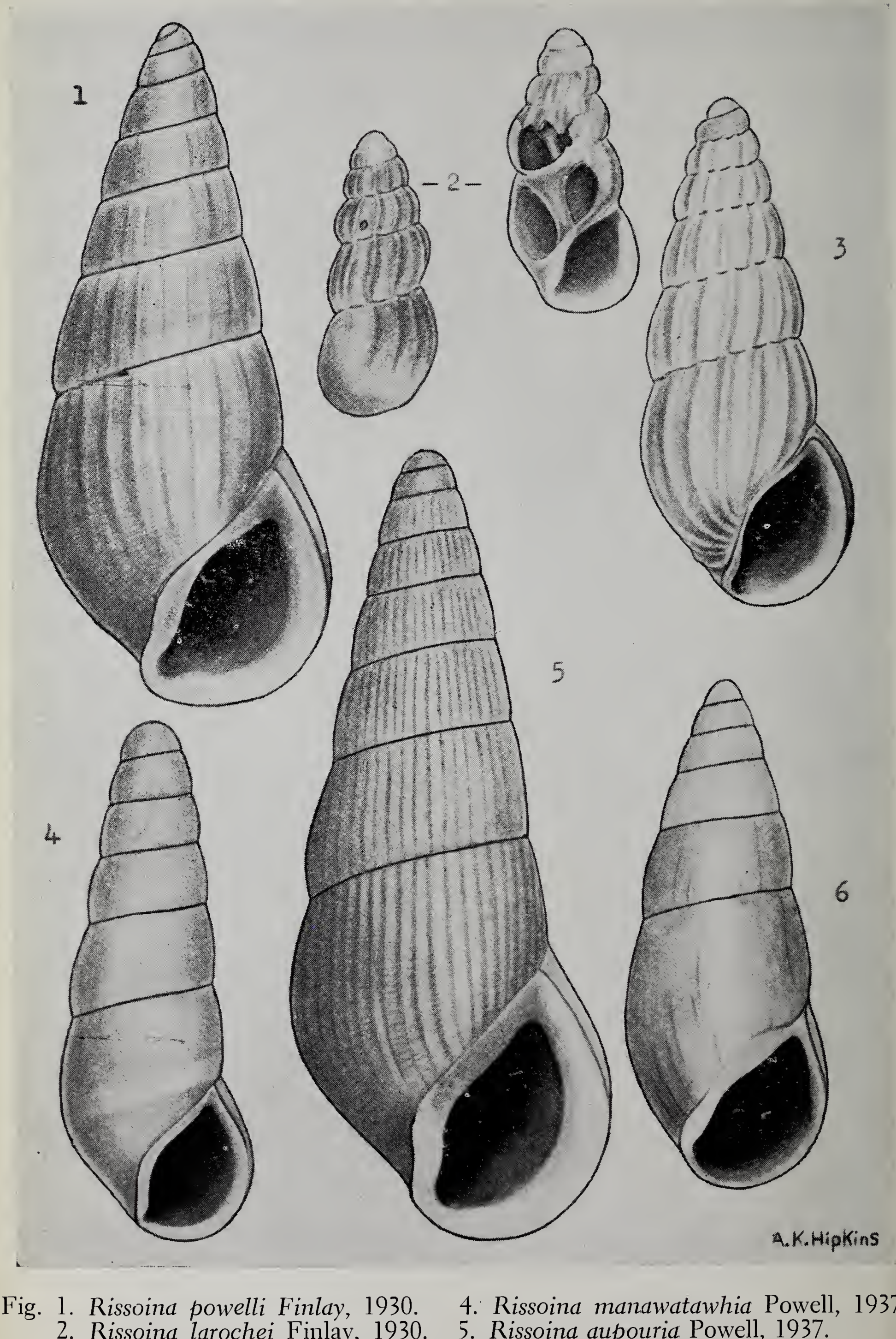

Fig. 1. *Rissoina powelli Finlay*, 1930.
2. *Rissoina larochei* Finlay, 1930.
3. *Rissoina fucosa* Finlay, 1930.
4. *Rissoina manawatawhia* Powell, 1937.
5. *Rissoina aupouria* Powell, 1937.
6. *Rissoina achatinoides* Powell, 1937.

any other New Zealand species and one of our most attractive *Rissoinas*."

NOTE.—The photograph accompanying Findlay's description appears to give a rather distored view of the aperture outline, which makes the columella look straight, when it is in fact oblique.

Rissoina larochei Finlay, 1930 (Fig. 2). "Shell very small for the genus, distinctly obliquely costate. Embryo relatively large, of about two smooth whorls, the tip rather prominent and inturned, the next whorl somewhat swollen. Four and a half whorls follow, fairly regularly convex, shoulder slightly flattened. Ten axials per whorl, their own width or a little more apart, in the shape of a shallow reversed S, but decidedly oblique, sloping forwards lower down, weaker and more distant on the shoulder, vanishing on base below the convexity. Whole surface appears smooth, but is densely crowded with minute crowded spiral grooves, only perceptible under high power. Aperture like *chathamensis*, but basal lip projecting further down and out; relatively large for so small a shell.

Height, 2.9 mm.; width, 1.3 mm.

Locality — 12 fathoms, Doubtless Bay, two shells dredged by W. La Roche.

Holotype in Auckland Museum (Finlay collection).

The only other *Rissoina* of this size in New Zealand is *rufolactea* Suter, which has a wider shell, flatter whorls, and much more numerous axials; its whole aspect is different."

NOTE.—As this species has not been illustrated before, I have provided two, as in this case the holotype was so badly damaged that a front and back view were necessary to gain a more complete picture. The paratype, also, was in very poor condition although complete in itself. The protoconchs of both specimens are worn and pitted. This species has been found, but not commonly, in shell sand from Spirits Bay, and Tapeka Point, Bay of Islands.

Rissoina fucosa Finlay, 1930 (Fig. 3). "Shell fairly small, strongly axially costate. Embryo apparently as in *chathamensis* (i.e. of 1½ smooth whorls, nucleus prominent), but somewhat smaller. Adult whorls 5½, markedly convex, sutures well cut in, not margined. Axials 13 per whorl, very strong and distant, 2½-3 times their width apart, slightly oblique from suture to suture, strong over whole body whorl right down to basal and inner lips, just before reaching inner lip they curve sharply over almost at right angles, and form a weak but distinct fasciole. Spirals practically absent except on base, where they form exceedingly fine and numerous spiral ridegs. Aperture as in *chathamensis*, but much more deeply and narrowly channelled below.

Height, 4.8 mm.; width, 2 mm.

Locality — 38 fathoms, Cuvier Island.

Holotype in Auckland Museum (Finlay collection).

This species strikingly simulates *Rissolina* Gould in the strong sculpture and tendency to form a fasciole, but the latter feature is very much stronger in typical *Rissolina*. The species seems really to be closely related to *chathamensis*, but apart from the fasciole (which *chathamensis* never has), it has fewer and more distant axials, fewer and conspicuous spirals, an unmargined suture, slightly more convex whorls, and a smaller test."

NOTE.—The photograph accompanying the decription appears to have part of the protoconch missing and Finlay mentions this at the beginning of his description. To quote his own words, "embryo apparently as in *chathamensis*." The photograph also shows, quite distinctly, a large grain of sand jammed in the aperture. This was present in the holotype I used for illustration, but the protoconch, although slightly worn, was complete and showed indistinct spiral lines on the second whorl. I have dredged this species, with *R. chathamensis*, in 9 fathoms in the Whangaroa Harbour.

Rissoina manawatawhia Powell, 1937. " Shell small, very tall and slender, glossy and smooth except for very faint, almost obsolete spiral scratches. Apart from weak, fairly numerous and somewhat irregular axial growth lines, there is no true axial sculpture. Whorls six, including a dome-shaped protoconch of two smooth whorls. Outlines slightly convex. Spire tall, about 2½ times height of aperture. Aperture small, oblique, ovate, angled above and channelled at base of columella. Outer lip thickened convex. Colour very pale pink with an indistinct narrow white spiral zone just above the suture.

Height, 3.7 mm.; diameter, 1.4 mm. (Holotype).
Locality — Off Three Kings Islands, "Discovery" St. 934, 92 metres.
Holotype in British Museum (Natural History).

This species is close to Finlay's *fictor*, from 38 fathoms off Cuvier Island, but differs in the practically obsolete spiral sculpture and smaller size. The colour differs also, but in this genus the coloration is so variable that it cannot be taken into account."

Rissoina aupouria Powell, 1937 (Fig. 5). "Shell rather large for the genus, elongate-conic, gracefully tapered. Spire tall, about one and two-thirds height of aperture. Whorls eight, including a protoconch of two smooth whorls. Post-nuclear sculpture of closely packed weak axial ribs and microscopic interstitial spiral threads. There are thirty-four axials on the penultimate whorl and they are about their own width apart. The spiral threads are very numerous and closely spaced over the spire whorls, but open out a little over the base. Aperture oblique, ovate, channelled above and below. Peristome continuous, outer lip, basal lip and columella heavily calloused. Colour bright yellowish-brown, protoconch and spiral callus white.

Height, 8.5 mm.; diameter, 3.5 mm. (Holotype).
Locality: Off Three Kings Islands, "Discovery" Stations 933, 934 in 92 metres.
Holotype in British Museum (Natural History).

The type of sculpture is very like that of Hedley's genus *Stiva* (1904), but the shell is a typical *Rissoina*.

It resembles Finlay's *powelli*, but differs in having twice as many axials."

Rissoina achatinoides Powell, 1937 (Fig. 6). Shell elongate-conic, smooth and glossy. Apart from numerous faint axial growth striae there is neither spiral nor axial sculpture. Whorls six, including a dome-shaped protoconch of two smooth whorls; outlines straight. Spire tall, just twice the height of the aperture. Aperture oblique, ovate angled above and distinctly channelled at the base of the columella. Outer lip slightly thickened, almost straight with side of spire. Columella oblique, short and twisted. Colour buff on the apical whorls, deepening to a rich golden-brown on the last two whorls. The interior of the aperture is of the same golden-brown colour, but the calloused columella is white.

Height, 4.8 mm.; diameter, 1.8 mm. (Holotype).
Locality — Off Waikuku Beach, near North Cape, "Discovery" St. 930, in 29 metres.
Holotype in British Museum (Natural History).

This is the only New Zealand *Rissoina* so far known that is entirely without both axial and spiral sculpture. It is near to Odhner' *achatina*, but that species has crowded faint spirals and an aperture of the *chathamensis* type. In *achatinoides* the aperture is proportionately rather smaller and has the underlip in line with the side of the spire."

*Acknowledgments*s

I express my grateful thanks once again to Dr. A. W. B. Powell, for his assistance and generosity, in supplying me with the holotypes from the Finlay collection. Also for his very kind permission, as holotypes were not available, to trace off his admirable drawings of R. *aupouria*, R. *achatinoides* and R. *manawatawhia*.

References:

FINLAY, J. H. "Additions to the recent Molluscan Fauna of New Zealand, No. 3" Trans. N.Z. Inst., vol. 61 p 227, 29th November, 1930.
POWELL, A. W. B. "New species of Marine Mollusca from New Zealand." Discovery Reports, vol. 15, pp 153-222. 1937.

Introduced Land Mollusca of New Zealand

—Some Further Notes

By H. E. WHITTEN

Vallonia costata (Muller): This species is to be added to our list of introduced molluscs. In my previous article (Bulletin 11, 1955), I referred to a colony of snails found by Mr N. W. Gardner at Devonport, and I mentioned the possibility that they might prove to belong to the above species. Since then I have been able to compare specimens from this colony with some examples of V. *costata* from Holland. There is no doubt in my mind as to their specific identity.

Vallonia excentrica (Sterki): Three further locality records may be added to those given in Bulletin 11.

Ardmore, near Papakura, on the underside of pieces of timber lying on the grass of the aerodrome. H.E.W. 11/12/57. Taipa Beach, Doubtless Bay, under moss on sand dunes. Dead shells were very abundant and living shells plentiful. H.E.W. 2/3/57. Tokerau Beach, Doubtless Bay, under moss on sand dunes, not common. H.E.W. 3/3/57.

Note.—On the dunes at Taipa is to be found an interesting association of snails living under the shelter of dune vegetation. On March 2 of this year I found the following species living together — *Austrosuccinea archeyi* (Powell), *Tornatellinops novoseelandica* (Pfr.), *Paralaoma* sp., *Helix aspersa* Muller, *Vallonia excentrica* (Sterki) and *Retinella nitidula* (Drap.). Living *Austrosuccinea* were rare. I found only two living specimens, both immature as was to be expected at that time of the year. There were a moderate number of dead shells in a well bleached condition. *Tornatellinops novoseelandica* is also apparently rather rare. I found only two specimens. The *Paralaoma* was, however, very plentiful on the surface of the sand under moss, along with V. *excentrica*. The *Helix aspersa* were all of the light-coloured dune-living form referred to in Bulletin 11. *Retinella nitidula* was not common. Of this species, also, I found only two specimens.

At the nearby Tokerau Beach the following day I found a similar association of snails, with the exception of *Retinella* and *Tornatellinops*. It is possible, however, that these may also occur there. The *Paralaoma* sp. and *Vallonia excentrica* were not as abundant as at Taipa, but *Austrosuccinea archeyi* was more common. Both live snails and dead shells of this latter species were plentiful.

Retinella nitidula (Drap). In Bulletin 12, 1956, Mr L. W. Stratton, of England, mentioned that he had received some snails from New Zealand which he had identified as the above species. The only information Mr Stratton has regarding those specimens is that they were collected from gardens at Auckland. The occurence of this species in New Zealand has been confirmed by my finding of two spcimens on the dunes at Taipa, 2/3/57. These specimens were sent to Mr Stratton who kindly made the identification.

These snails are not unlike *Oxychilus cellarius* (Muller) in general appearance, but the spire of *nitidula* is slightly higher, the surface less glossy, and the umbilicus is slightly wider and deeper. The aperture of *nitidula* is less oblique than in *cellarius*. It is possible that the superficial similarity between these two species may have led to mis-identification in some cases, and that some of the numerous records for *cellarius* in the country, may not be for that species at all, but for *nitidula*. Further investigation is necessary here.

Oxychilus alliarius (Muller): Another locality record may be added for this species. – Stoke, Nelson, in greenhouse, I. N. Inglis.

Cochlicopa lubricella (Stabile) = *C. minima* (Siesmaschko).

In Bulletin 12, Mr Stratton mentioned that this species had recently been separated from *C. lubrica* (Muller), and that it would be interesting to see specimens of the introduced *Cochlicopa* from this country in order that the identification of the species be confirmed, I accordingly sent to Mr Stratton some examples collected from my garden at Avondale, Auckland. He has since informed me that they are *lubricella*.

I think that we must leave *Cochlicopa lubrica* on our list as well, as I have seen local specimens which are bigger and stouter than my Avondale specimens, and would be, I presume, *lubrica*. Considerable work would be required to sort out the occurence of these two species in New Zealand, for one or other, or both, are very common in the northern half of the Auckland province at least.

Vertigo pygmaea (Drap.): The single dead shell, reported and figured in Bulletin 11, and tentatively referred to the above species, may now be accepted as indeed belonging to it. In Bulletin 12, Mr Stratton confirmed this from the illustration, and recently I have been able to compare the shell itself with specimens of *pygmaea* from Bournemouth, England. The identity is in little doubt. Unfortunately no further specimens of this minute snail have, as yet, come to hand.

Pupilla muscorum (Muller): This snail may now be removed from the "doubtful" list. It has been found again in a living condition. Mr E. N. Milligan discovered it living in a rock garden at Parnell, Auckland, October, 1956.

Agriolimax reticulatus (Muller): In my previous article a printing error was responsible for the name "*Agriolimax arestes* (Linnaeus)" being given for a not uncommon slug found here in New Zealand. This, of course, should have been *Agriolimax agrestis* (Linnaeus). Mr Stratton has pointed out that though this name has been used in the past for a common English slug, yet in reality it has been wrongly so used. True A. *agrestis* is a rare slug in England. The slug widely known as *agrestis*, is properly named A. *reticulatus* (Muller). I should say that the New Zealand introduced slug is almost certainly *reticulatus*.

Helicella (*Candidula*) *caperata* (Montagu): Recently a colony of these snails has been found by Mr E. N. Milligan near Mangamuka, Northland. This is only the second record of this species north of the Wellington-Wairarapa area. The other was that of a colony at Waikawau, Thames Coast. The inland locality of the Mangamuka specimens is unusual. Most New Zealand specimens of this species have been found on sandy soil locations near the sea.

Notes on some workers on N.Z. Conchology

By T. P. WARREN

THE first scientific collection of New Zealand shells was made during Captain Cook's first voyage in 1769-1770, the collectors being Sir Joseph Banks and Dr. Solander. On the second voyage – 1773-1774, the collectors were Dr. Reinhold and Mr George Forster. Shells were collected at Bay of Islands, Dusky Sound and Queen Charlotte Sound, some 40 or so species being collected, and many were named by Thomas Martyn ("Universal Conchologist" 1784) and by Perry ("Conchology" 1811). A critical list and review of the shells was published in a German paper in 1872 by Dr. E. von Martens. Some of our best-known shells were among the first collected, such as *Maurea tigris, Cantharidus opalus, Haliotis iris, Cookia sulcata, Astraea heliotropium* and *Strutholaria papulosa*, to mention but a few.

R. P. Lesson voyaged with Duperry on the ship "Coquille" during a world cruise which lasted from 1822-25, and collected mollusca at the Bay of Islands in April, 1824. Of the species described by Lesson in papers published between 1826 and 1832 on the results of this voyage, a well known example is *Sigapatella novaezelandiae.*

From 1826-29, Dumont D'Urville made his notable world voyage in the "Astrolabe" and accompanying him were the French naturalists Quoy and Gaimard, whose names are very familiar to New Zealand collectors by their adaptation to many genera and species, a fitting tribute to these pioneer workers whose published results show well their care and foresight. Their collections were made mostly at Queen Charlotte Sound, the Thames Estuary, some off-shore islands and dredge stations. Their shells are preserved in the Paris Museum.

In 1835, the Rev. W. Yate, an intrepid missionary, sent a collection of 29 east coast shells to the British Museum, where they were catalogued by the Conchologist, Dr. J. E. Gray, who described 10 new species. One of these is our well-known Venerid, *Bassinia yatei,* named in compliment to the discoverer.

An American expedition collected in New Zealand between 1838 and 1842. The conchologist of the party, J. B. Couthoy, fell ill during this time, and the shells were ultimately described by Augustus A. Gould in 1847-48. Included in the species were numerous fresh water ones, and also molluscs from the Auckland Islands.

In 1840 Dr. Dieffenbach collected at the Chatham Islands and the North Island and forwarded 58 species to Dr. Gray who published a commentary with descriptions of new species in 1843. One is the Toheroa (*Amphidesma ventricosum*), others include *Hyridella menziesi, Melanopsis trifasciata,* and *Sypharochiton sinclairi.* This last was named after Dr. Sinclair, whose collection of New Zealand shells was sent to the British Museum in 1842 by Dr. Stanger.

The French ship "Astrolabe," accompanied by the "Zeelee," re-visited New Zealand in 1841, calling at the Bay of Islands, Akaroa, Port Chalmers and the Auckland Islands. The records of the mollusca were written by Hombron and Jacquinot, the authors of *Cellana strigilis* and *Margarella antipoda,* two very characteristic Sub-antarctic shells.

A second expdition arrived in 1841 when the British ships, H.M.S. "Erebus" and "Terror," commanded by Sir James Clark Ross, visited Campbell Island, the Auckland Islands and Russell. The mollusca were eventually published in 1874 by Dr. E. A. Smith of the British Museum. As well as describing new species, Dr. Smith at the same time illustrated some type specimens not previously figured.

During the years 1847-49 H.M.S. "Acheron" was engaged in surveying the New Zealand coastline and in 1849 the conchologist, Frederick Strange, visited the country aboard her, collecting at Auckland, Wellington and Banks Peninsula, as well as carrying out some dredging experiments. The collection was purchased by Hugh Cuming, a well-known conchologist of the period, and some new species contained in the collection were described by A. Adams and G. P. Deshayes in various numbers of the "Proceedings of the Zoological Society" published in the 1850s. Our prized *Coluzea spiralis* was amongst those described for the first time during this period.

Dr. Greenwood collected some land mollusca near Auckland which were sent to the British Museum, and some were described by Dr. Gray in 1849 ("Proceedings Zoological Society") and by Dr. L. Pfeiffer ("Malak. Blatter"). Of the new species *Rhytida greenwoodi* perpetuates the discoverer's efforts.

The Austrian expedition on the frigate "Novara" arrived in 1859. Notable members were F. von Hochstetter, G. von Frauenfeld and J. Zelebor, whose names have been given to mollusca and also been adopted as place names, etc. in the Dominion. Collections made by them were worked on by Dr. Pfeiffer and Professor W. Dunker in 1861, and by Frauenfeld in 1867. Some later lists published in 1869 are somewhat inaccurate as many of the shells are wrongly ascribed to New Zealand.

During 1874 and 1875, Drs Filhol and Krone collected at Campbell and Auckland Islands respectively, and subsequently Dr. Filhol collected in several parts of New Zealand. The results were published in 1885, and some new shells described are, I understand, located in the Paris Museum of Natural History.

A notable event in 1874 was the visit of the famous "Challenger" expedition which carried out deep-sea dredging and trawling off the New Zealand coast and which produced many hitherto unknown species. The results of the expedition, which was a global one, were published in several volumes; and the mollusca were written up by several competent workers of that time, with each one doing a separate class, such as Smith, (Pelecypoda), Watson (Gasteropoda), and so on.

Captain F. W. Hutton, who lived from 1836 to 1905, is regarded as the founder of New Zealand Conchology as we know it today. After active service with the British Army in the Crimea and India, he came to New Zealand as geologist to the N.Z. Survey. In 1873 he published a Catalogue of Mollusca, and in 1880 his "Manual of N.Z. Mollusca," both unfortunately without illustrations, though he did, however, realize the need for the introduction of new genera to accommodate the endemic fauna, and so introduced quite a few new names. A very capable and clever man with wide interests and vision, he named many new species of land and marine mollusca, and did much research into their dentition and anatomical details. Without the modern scientific aids we now have, his work is all the more to be admired. In 1876, Hutton became Professor of Natural Science at Otago University, and in 1883 Curator of the Canterbury Museum. One of his daughters became the wife of Mr John Grigg of the well-known Longbeach estate near Ashburton.

T. F. Cheeseman was a contemporary of Professor Hutton, and though primarily a botanist of international fame, he did some valuable work on mollusca in his early life. His anatomical work on Nudibranchiata is still taxonomically correct, and his other work continues to stand on its own merits. From 1874 until the time of his death in 1923 he was intimately connected with the Auckland Institute and Museum.

Henry Suter (1841-1918) came from Switzerland in 1886, and though a chemistry technician by profession, he tried farming for five years without much success. Fortunately he became a friend of Professor Hutton, who encouraged his studies of New

Zealand mollusca and was able to aid him in finding more congenial employment. He was later detailed by the Government of that time to compile his "Manual of N.Z. Mollusca," for which he was paid £500 in three years, though the work actually took nearer six years to complete. The "Manual" was published in 1913, followed by the "Atlas of Plates" in 1915. Though both works are now out of date, especially regarding molluscan names, they are still a help to the amateur collector, and stand as a monument to a lifetime of careful research. After the "Manual" was published, Suter did relieving work at Museums and was later appointed Paleontologist to the Geological Survey, but unfortunately his work there was marred by many errors and has had to be subjected to very heavy revision.

During the early years of the present century research and collecting were carried out by a number of people, all of whom did good work in various spheres. Notable among them were: Captain Bollons, of the Government steamers "Hinemoa" and "Tutanekai," who for many years collected and dredged in various parts of the Dominion, thus materially helping to increase our knowledge of species and their distribution; the Rev. W. H Webster who described many new species and did excellent work on small land snails; Miss M. Mestayer, who was for a number of years the Conchologist at the Wellington Museum, and whose work is since receiving the recognition it deserves; Mr W. E. La Roche, a marine engineer, who discovered many new shells in dredgings he made in the Aupourian marine faunal province; the Hamiltons, father and son, who will always be remembered for their Macquarie Island expeditions and research; Robert Murdoch, whose careful research and fine drawings make one regret that he was actively connected with Conchology for only a comparatively short period of his life. Two Australian conchologists of the period also considerably advanced our knowledge of New Zealand mollusca. These were Charles Hedley and Tom Iredale. Iredale's "Commentary" on Suter's "Manual" did a great deal to clear up much of the confusion surrounding N.Z. genera.

In more recent years Drs. C. E. R. Bucknill, H. J. Finlay and A. W. B. Powell have earned laurels for their research and publications. Bucknill's "Shells of New Zealand," published in 1924, was for many years the standby for young collectors. He also described some new shells and microscopic details of others already known. Dr. Finlay's papers helped to bring species and nomenclature up to date — his most important work is a commentary on Suter's "Manual"; published in 1926, it is still a valuable work of reference. Dr. Powell has, over the past 30 years published nearly a hundred works dealing with Recent and Tertiary mollusca, and new species and genera described by him have increased our lists by several hundred, while his brilliant illustrations are known to all students of New Zealand Mollusca. It was he who formed the Club which has now become the Conchology Section of the Auckland Institute, and it is a tribute to his keenness and encouragement that two of the early Club members now hold responsible positions elsewhere – Dr. C. A. Fleming, who is Senior Paleontologist at the Geological Survey, and Dr. R. K. Dell, Conchologist to the Dominion Museum, Wellington, both of whom are the authors of numerous papers dealing with new shells, both Tertiary and Recent. A number of other workers have also, in recent years, made valuable contributions to our knowledge of our molluscs. Among them may be mentioned Drs. J. Marwick, W. R. B. Oliver and C. R. Laws, and also Mr A. E. Brookes.

Recent Molluscan Literature

SINCE the begining of 1956 several publications have appeared with matter of interest to students of our New Zealand molluscan fauna. Among them have been the following:–

OLSON, O. P. "The Genus *Baryspira* in New Zealand." N.Z. Geol. Surv. Pal. Bull. 24 – February, 1956.

A revision of the systematics of the N.Z. Tertiary and Recent species of *Baryspira* Fischer. Three new subgenera are proposed and several new species of Tertiary forms are describd. Of chief interest to students of our Recent mollusca are the short critical descriptions and the photographed figures of all species. Some changes in the subgeneric locations of Recent species are made.

DELL, R. K. "Some Off-shore Mollusca from New Zealand." Rec. Dom. Mus. Vol. 3 pt. 1 pp 27-59. – April, 1956.

Dr. Dell describes two new genera and twenty new species and subspecies. Some changes in nomenclature are made. Most of the species described and discussed in this paper are from material collected from trawling and dredging expedition in the Cook Strait area. Some material from "Galathea" dredgings and some from the Chatham Islands Expedition of 1954 are also included. The genus *Globisinum* Marwick and *Coluzea* Allen are discussed in some detail, as is also the occurence of *Eucominia* Finlay in the Cook Strait area.

DELL, R. K. "Fresh Water Mollusca of New Zealand, Parts II and III." Trans. Roy. Soc. N.Z. Vol. 84 Pt. 1 pp 71-90 – October, 1956.

In these two papers the author continues his revision of the N.Z. fresh water molluscs. Here he discusses all N.Z. species previously assigned to the genera *Limnaea*, *Myxas* and *Isidora*. A rather drastic revision is advocated. This reduces the number of valid species in these groups considerably. Some important name changes are proposed.

DELL, R.K. "The Archibenthal Mollusca of New Zealand." Dom. Mus. Bulletin No. 18 – November, 1956.

This large bulletin of 325 pages is an important publication. For the first time it discusses in detail the molluscs from our waters beyond the boundaries of the continental shelf (i.e. from depths greater than 100 fathoms). Four new genera are established. 91 new species and subspecies are described. Species are described in 7 genera not previouly recorded in New Zealand waters. In addition, forms of 6 genera previously known only as fossils in this country are described as living shells.

The systematics of the following groups are discussed in some detail – *Nucula, Cyclopecten,* Limidae, Thyasiridae, *Cuspidaria,* Lepetidae, Eulmidiae, *Fax, Austrofusus* and *Retusa.* A check list is given of all mollusca recorded from depths greater than 100 fathoms. There is a total of 595 species and subspecies on this list.

An interesting and useful discussion of the origin, distribution and relationships of our deeper water molluscs is included.

The volume is well illustrated with figures of new species and subspecies and also with new figures of several previously described species.

RALPH, Patricia M. and YALDWYN, T. C. "Sea Floor Animals from the Region of the Portobello Marine Biological Station, Otago Harbour."
Tuatara, Vol. VI Pt. 2. – December, 1956.

The title of this interesting article indicates its contents. Good descriptions and illustrations of the more common sea floor animals are given –including those of a number of molluscs.

BATHAM, E. J. "Ecology of Southern New Zealand Sheltered Rocky Shore."
Trans. Roy. Soc. N.Z. Vol. 84 Pt. 2 pp 447-465 – December, 1956.

Molluscs feature quite prominently in this study of the ecology of a rocky portion of the shore near Portobello Marine Station, Otago Harbour. The information here will be useful to all whose interest in molluscs goes beyond the mere taking and study of shells. The description of the plant and animal communities in the different zones is most helpful and provides an interesting comparison with studies already published from other localities in New Zealand.

DELL, R. K. "A Revision of the Recent Scaphopod Mollusca of New Zealand."
Trans. Roy. Soc. N.Z. Vol. 84 Pt. 3 pp 561-576. April, 1957.

In this revision of the N.Z. tusk shells, Dr. Dell not only reviews the systematic arrangement of the New Zealand species, but also provides useful keys for the differentiation of the species. Full notes on the distribution and depth range of these molluscs are given. Good illustrations enhance the value of this paper. As Dr. Dell's arrangement of the species in the family Dentaliidae differs a little from that found in Dr. Powell's latest

(1957) checklist, a revised list, based on Dr. Dell's arrangement, is here given.

Dentaliidae:

Dentalium Linnaeus, 1758 (*D. elephantinum* Linn.)
tiwhana Dell, 1953 F.M. Tasman Sea. *
(*Fissidentalium*) Fischer, 1885 (*D. ergasticum* Fischer)
zealandicum (Sowerby, 1860) A.C.F.M. *
(*Laevidentalium*) Cossman, 1888 (*D. incertum* Deshayes).
ecostatum T. W. Kirk, 1880 C. *
(*Antalis*) Hermannsen, 1846 (*D. entalis* Linn).
diarrhox Watson, 1879 A.M. Tasman Sea. *
nanum Hutton, 1873 A.C.F. *(= *huttoni* Kirk = *marwicki* Mestayer).
suteri Emerson, 1954 C.F.M. *
glaucarena Dell, 1953 M. *

DELL, R. K. "Natural Areas in New Zealand — Land Snails".
Proc. N.Z. Ecological Soc. No. 4 — May, 1957.

This short paper is part of a symposium, in which attempts are made to divide New Zealand into natural faunal areas. Dr. Dell, on the basis of known land snail distribution, provisionally proposes 11 broad areas. He points out, however, that "much remains to be done both as regards systematic revision and exact knowledge of distribution before we can be sure of boundaries, if such exist."

CHILD, J. 'Shellfish of the Bay of Plenty." Periwinkle Press, Tauranga, 1957.

This little book has been written, as the author states, "to help children of all ages to enjoy the thrills of shell collecting." Useful introductory notes about molluscs in general are followed by brief descriptions of over 80 species of marine molluscs commonly found in the Bay of Plenty area. About 70 of these species are illustrated by line drawings. Locality and habitat notes are given for each species. It is a useful little book for beginners.

FLEMING, C. A. "The Genus Pecten in New Zealand." N.Z. Geol. Surv. Pal. Bull. 26 — June, 1957.

In this Bulletin, Dr. Fleming reviews the Tertiary and Recent forms of *Pecten*. He systematically describes and classifies the New Zealand forms and also discusses the morphology, biology and distribution of the species in this genus. The two living forms are dealt with in some detail. Of particular interest is the assigning of Manukau and Kawhia harbour populations of *Pecten* to the subspecies *novaezelandiae rakiura*, which is the form found in Otago, Stewart Island and the Chatham Islands. We have here a parallel to the occurence of the southern *Maurea punctulata stewartiana* Oliver (= *urbanior* Finlay) in the Auckland West Coast harbours.

MARWICK, J. "New Zealand genera of Turritellidae and the species of *Stiracolpus*."
N.Z. Geol. Surv. Pal. Bull. 27 – June, 1957.

In the first part of this Bulletin, Dr. Marwick discusses the relationship between the N.Z. groups of Turritellidae, and revises the systematics of the genera and subgenera of both fossil and living forms. The second part "describes the known occurences and supposed relationships of twenty-nine species and subspecies of Stiracolpus, a Pliocene to Recent subgenus of *Zealcolpus*, followed by a systematic description of the different forms, each of which is figured. The descriptions are based mainly on the way in which the spiral sculpture develops."

As this Bulletin not only describes new species but also rearranges the older species, a revised list of Recent forms may usefully be given.

Maoricolpus Finlay, 1926 (*Turritella rosea* Q & G).
- *finlayi* Powell, 1940 A. *
- *roseus roseus* (Quoy and Gaimard, 1834) A.C.F.M.
- *roseus manukauensis* Powell, 1931, A.

Zeacolpus Finlay, 1926 (*Turritella vittata* Hutton).
- *vittatus* (Hutton, 1873) A.C.
- (*Stiracolpus*) Finlay, 1926 (*Turritella symmetrica* Hutton).
- *ahiparanus* (Powell, 1927) A. *
- *ascensus* (Marwick, 1957) M. *
- *blacki* (Marwick, 1957) C. *
- *delli* (Marwick, 1957) M. *
- *knoxi knoxi* (Marwick, 1957) M. *
- *knoxi tardior* (Marwick, 1957) M. *
- *maorius* (Powell, 1940) A. * (= *Gazameda maoria* Powell).
- *mixtus* (Finlay, 1930) A. *
- *pagoda pagoda* (Reeve, 1849 A. (= *fulminatus* Hutton).
- *pagoda powelli* (Marwick, 1957 A. *(= *pagoda* of Powell's Checklist).
- *symmetricus* (Hutton, 1873) F.

POWELL, A. W. B. "Shells of New Zealand."
Whitcombe and Tombs, 1957

The long awaited third edition of Dr. Powell's handbook appeared in July of this year, under a slightly different title. It follows the same general plan as its predecessors, but has been completely revised and enlarged. Many additional illustrations enhance the value of this book. 530 species are here illustrated. For most collectors the most valuable section of the book is the checklist. This has been brought up to date. A number of nomenclatural changes have been made and there has been some systematic rearrangement in places. There are now 2207 species and subspecies listed, an increase of 328 since the last (1947) edition. A welcome addition is an index to the genera in the checklist. A ready system of reference, often used in the past by collectors, is, however, now missing, as the species in the list are no longer numbered. This book will continue to be an indispensible part of the working kit of every New Zealand conchologist and collector.

MILLIGAN, E. N. "Land Mollusca of some Off-shore Islands."

Tane, Vol. 7, 1957

In this the author continues his report of the land molluscs of the islands off the East Coast of the Auckland Province. Previous notes have appeared in "Tane" vol. 6 and in the Conch. Sect. Auck. Mus. Bulletin 11. Here the islands in question are Mayor Island, Marotiri and Whakahau Islands (both of the Chickens group), and Great Barrier Island. There is an interesting discussion as to the ways by which these islands may have been colonised by their respective land snail populations.

—H. E. WHITTEN.

Items of Interest from Leigh

By T. P. WARREN

As a result of fine, calm weather last summer, the beaches near Goat Island have returned to normal as far as "washups" are concerned, mostly because the sand now covers what were merely stretches of rocky shore owing to continual gales during 1956.

Three specimens of the rather rare *Marginella maoriana* have been found recently, prior to this only one was known to me from here.

A visiting collector, Grant Bawden, had the extremely good luck to find a specimen of *Coluzea spiralis* washed up, in quite good condition, too.

Between the months of January and May, large numbers of *Tethys tryoni* and *Bursatella glauca* were seen in the rock pools — during the same period a few *Tethys brunnea* were about, but not nearly as many as were here in 1955.

A most interesting discovery was a valve of *Septifer cf. bilocularis*, a small shell of the family Mytilidae. I found it in a piece of seaweed on the beach and was, at first, going to pass it by thinking it was simply a small valve of *Mytilus canaliculus*. But a second glance convinced me it was something quite different, so luckily I secured it. The shell is in quite fresh condition, and the outside is coated with a white encrustation.

I recently found an empty shell of *Vicimitra maoria* in a pool. Most of those found so far are rather worn and shabby, but this one was in a fresh condition and is a lovely rich chocolate brown with small splashes of white at the suture. The protoconch is well defined as also are growth lines on the upper spire whorls. The shell is just 1½ inches long and is about three-quarters grown, I should say.

While sieving for shells on the cockle beds in Whangateau Harbour, last summer, Syd Hulme and I both found some living specimens of *Cylichnina striata* which were stained with rust deposits. This gave the shells a most attractive banded appearance. Large numbers of *Marginella pygmaea* and *Pervicacia tristis* were collected and many juvenile *Baryspira australis* were seen. Syd also had the good fortune to collect a live *Philine angasi.*

Large numbers of young *Octopus maorum* have taken up residence in the local rock pools — one day I counted 22 along about half a mile of coast. One of them grabbed me by the leg while I was exploring a pool and I still hope that the octopus got the bigger fright during the commotion which followed!

Some Notes from Stewart Island

By E. K. SMITH, Halfmoon Bay

The warm water community which commenced to come ashore in the Mason Bay area in the summer of 1955-56, continued in greater numbers this last season. Quantities of violet snails (*Janthinia violacea* and *J. exigua*), ram's horns, Portugese men-of-war, further paper nautilus and some by-the-wind sailors were picked up at Mason Bay; and paper nautilus were collected from various other beaches, including Pegasus, Halfmoon Bay, Horseshoe Bay and the Old Neck. In Foveaux Strait itself, Portugese men-of-war were very numerous, and the same was reported of the waters to the East and West of the Island. As the fishermen find that the tidal current splits off Weather Point on the West of the Island, and off East Cape on the East, it is obvious that the whole of Stewart Island must have been surrounded by these (to us residents) rare animals.

Verticipronus mytilus. Single valves of this little mussel are very common; but recently I have found three communities of live specimens — one on large seaweed covered pauas from Breaksea Island near Port Adventure; one in seaweed from below the first line of bull kelp on the Ocean side of the Old Neck, and one in a bryazoan from off Solander Islands in from 15 to 20 fathoms of water. The two former localities are both exposed to heavy seas.

Maurea: The oyster dredges and the crayfish pots yield a steady supply of *punctulata stewartiana* in from 10 to 30 fathoms of water, but the larger and more handsome *tigris* is still a rare find here. I have had several large specimens from Mr A. D. Johnston of Braggs Bay, taken from off the bait in crayfish pots set in from 15 to 30 fathoms of water off Bench Island. He reports finding them there regularly, any time that there are only a few crayfish in the pots; and always they are sitting firmly on the bait, despite the shaking they must have received as the pot was dragged up. These crayfish pots are long rectangular wooden frames, covered with fine wire-netting, and with a funnel-shaped opening in the top. The bait (fish) hangs by a piece of flax tied to the netting above near to the funnel, but well clear of the wooden frame. As the netting is of far too fine a gauge for the animals to get through, they must enter by the funnel. The question is, "How do they reach the bait?"

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Mary Mouat — A Tribute

On July 16th there passed away in her sleep, one of our most esteemed members.

Mrs Mouat was born in Arrowtown, a flourishing goldmining centre and as a young woman went up to the isolated "Skippers" to housekeep for her father, Edwin Foord, while he was engaged as one of the first electricians at that well known mine. When a new underground manager was appointed, the lass was among one of the groups of people who watched as the newcomer was escorted up the river. The man was Mr Mouat. After their marriage in Arrowtown the couple spent some time at "Skippers" where Mrs Mouat was, for quite a period, the only woman in the community.

Mr and Mrs Mouat moved about the South Island a good deal as Mr Mouat was a surveyor for the mines. Sometimes when her husband was away in some particularly rugged country, Mrs Mouat would stay with her mother in Dunedin. At times she would accompany him and leave her sons in the care of their grandmother.

While living in Greymouth, where Mr Mouat had a shop, she had a particularly large specimen of a Baler shell given to her, but it was not until about 1912, after the family had returned from a period in Tonga, that the shell collection was started in earnest. The Baler shell always held pride of place in the collection of shells which was rapidly accumulated.

Mrs Mouat joined the Conchology Club about 1935 and by then had quite a good selection of foreign and New Zealand shells, and unbounded enthusiasm for her hobby. During the following twenty years, she found time in a busy life to make an excellent collection of Paryphanta, one of which is named after her. These were always her favourite shells. For some years the family lived in Collingwood, West Nelson, where Mr Mouat had a claim. Further downstream from the dam where the menfolk worked, Mrs Mouat loved to sluice for gold and would go off and work happily by herself. Several times she gained enough to enable her to take a good holiday.

In her quest for Paryphanta this energetic woman made a trip on horseback up to the "Castles" where *Paryphanta compta* is found. The country is very rugged with no well defined tracks, so that horses had to pick their way among the outcrops of limestone and through copses of bush. A pamphlet dealing with New Zealand snails was published. This was written by Mrs Mouat in the form of a narrative.

Her general collection grew and some very fine foreign shells came in exchange for New Zealand species. Additions to her collection were made on a trip to Australia and later during trips to Fiji.

Always a very keen collector, Mrs Mouat gave every encouragement to anyone who wanted to start a shell collection. This was particularly so with youngsters and several, now grown up and quite well known scientists have been quick to acknowledge the help they received in their early efforts at shell collecting and in nature study in general. She was a very good listener.

Apart from her interest in shells, Mrs Mouat was the authoress of a delightful little book of Maori Legends put together in the form of a fairy story for children. This book, "Whero in the Land of Maui" has been used in the schools here and has also been much appreciated by children and adults overseas. Another, smaller publication dealt with New Zealand birds.

A club in which Mrs Mouat took some interest was the Inventors' Club. She took out three patents, one of which was sold for £100 and has since been developed in Holland.

After Mr Mouat's death in 1956, his indomitable wife took his ashes to Purakanui in the South Island. She spent her 80th birthday in Arrowtown. On her return to Auckland she packed her bag again and went by plane on a visit to her son in Fiji. There, shells were collected at several places near Suva.

The monthly meetings and field days of our Section were a source of great interest to Mrs Mouat but when a broken hip prevented her from attending the last few months, she was always pleased to see her "shelly" friends and eager to hear of their collecting activities. — N. GARDNER.

A Checklist of Mollusca Taken by Wellington Trawlers

By S. G. HULME, N.Z. Geological Survey, D.S.I.R., Lower Hutt

INTRODUCTION

For a period of eight months, from September 1956 to April 1957, regular visits were made to several steam trawlers working from Wellington. During that time the Mollusca herein listed were collected.

These vessels usually work to a regular routine, leaving port Sunday night and returning the following Thursday night or Friday morning.

The otter trawl is the most extensively used type of fishing gear on the Cook Strait grounds, and all the material recorded in this list was taken by that method. Small specimens have been taken from various parts of the gear, for example from along the footrope and cracks in the otter boards, both of which actually drag over the sea floor. A large part of the shells and other debris brought up in the net is promptly thrown back into the sea, so that only a small proportion of the catch actually reaches the collector.

ACKNOWLEDGEMENTS

The writer wishes to thank Dr. R. K. Dell for assistance with the identification of some of the smaller species, and for advice on various fishing ground localities. Thanks are due also to Dr. C. A. Fleming for his kindly advice and encouragement throughout this article.

LOCATION OF FISHING GROUNDS

Grounds most extensively fished are located in five main areas:

(a) Kapiti Island area in 20-50 fathoms.
(b) Off the Kaikoura Coast in 20-40 fathoms.
(c) Cape Campbell area in 40-70 fathoms.
(d) Cape Palliser area in 40-60 fathoms.
(e) Off Castle Point in 25-80 fathoms.

Because these grounds are not too far distant from each other, it is possible for a trawler to visit several areas within a week or so. Even though only one or two grounds are usually visited, quite large areas of the sea bottom may be covered by the trawls during five or six days fishing. Thus the collector may be confronted with a large number of specimens representing several populations or communities from different areas. Certain species seem to dominate the fauna of one particular ground although they may occur less commonly elsewhere. Exactly what is the detailed distribution pattern of any species is difficult to ascertain accurately from material taken by commercial trawlers.

The most common species recorded were:

Alcithoe calva Powell, 1928 (B), (C).
Alcithoe larochei Marwick, 1926, Mostly (C).
Penion ormesi Powell, 1927, (C).
Xenophalium (Xenogalea) hamiltoni Powell, 1928 (B), (C).
Austrofusus glans (Roeding, 1798), (B), (C), (D).

Other species worthy of note:

Maurea cunninghami pagoda (Oliver, 1926) (B).
Fusitriton laudandum Finlay, 1926, (B).
Xenophalium (Xenogalea) abernethyi Dell, 1956, (E).
Xenophalium (Xenogalea) abernethyi Dell, 1956, (E).
Aoteodrillia cf. wanganuiensis chordata (Suter, 1908), Widespread.
Splendrillia aoteana Finlay, 1930. Widespread.

Not all the species in the following list can be localized accurately, but wherever possible an indication of their approximate locality is shown by the capital letters in brackets immediately after the author. These letters refer to the five main fishing grounds, (see under Location of Fishing Grounds).

CHECKLIST OF MOLLUSCA FROM WELLINGTON TRAWLERS

PELECYPODA

Nucula (Ennucula) strangei A. Adams, 1856 (C) & (D) Alive.
Linucula gallinacea Finlay, 1930. (C) Alive.
Ovaleda powelli Dell, 1950. (C) Alive.
Neilo australis (Quoy & Gaimard, 1835). (E) Alive.
Barbatia novaezelandiae Smith, 1915. (A) Alive.
Glycymeris laticostata (Quoy & Gaimard, 1835). (A) Dead.
Musculus impactus (Hermann, 1782). (A) Alive.
Atrina zelandica (Gray, 1835). (A) Alive.
Chlamys zeelandona (Hartlein, 1931). (A) Alive.
Chlamys gemmulata gemmulata (Reeve, 1853). (B) Alive.
Chlamys cf. *taiaroa* juv. (B) Alive.
Chlamys sp. juv. (B) Alive.
Limatula maoria Finlay, 1926, (A) Dead (Recently).
Monia sp. juv. (B) Alive.
Ostrea charlottae Finlay, 1928. (B) Alive.
Cardita aoteana Finlay, 1926 (A) Alive.
Diplodonta zelandica (Gray, 1835). (A) Dead.
Venericardia purpurata (Deshayes, 1854). (A) Dead.
Pleuromeris zelandica (Deshayes, 1854). Widespread. Dead.
Gonimyrtea concinna (Hutton, 1885). Widespread. Dead.
Markellia rotunda (Deshayes, 1855) (C). Dead, pairs.
Nemocardium pulchellum (Gray, 1843). Widespread, Alive.
Dosinia lambata (Gould, 1850)(A). Dead, pairs.
Dosinia (Phacosoma) maoriana (Oliver, 1923) (A) Dead.
Notocallista multistriata (Sowerby, 1851) (E) Alive.
Tellinella eugonia (Suter, 1913) (C) Alive.
Tellinella huttoni huttoni (E. A. Smith, 1885) (B) Dead, pair.
Scalpomactra scalpellum (Reeve, 1854) (A) Alive.
Hiatella australis (Lamarck, 1818). Widespread, Alive.
Notocorbula (Anisocorbula) zelandica (Quoy & Gaimard, 1835). Widespread, Alive.
Pholadidea cf. spathulata (Sowerby, 1850) (C) Dead, pairs.
Myadora novaezelandiae (E. A. Smith, 1880) (C) Alive.

CASTROPODA

Maurea cunninghami (Griffiths & Pidgeon, 1833). (B) Alive.
Maurea cunninghami pagoda (Oliver, 1926) (B) Alive.
Maurea pellucida forsteriana Dell, 1950 (B) Alive.

The three above species are not very clear cut from each other.

Maurea tigris tigris (Martyn, 1784) (E) Dead, 1 specimen.

Linemera? n.sp. Dead.
Astrea heliotropium (Martyn, 1784) (B) Alive.
Maoricolpus roseus roseus (Quoy & Gaimard, 1834) (A) Alive.
Zeacolpus (zeacolpus) vittatus (Hutton, 1873) (A) Alive.
Zeacolpus (Stiracolpus)delli (Marwick, 1957) (B) Dead.
Epitonium jukesianum (Forbes, 1852) (A) Dead.
Trichosirius inornatus inornatus (Hutton, 1873) (A) Alive.
Zegalerus tenuis (Gray, 1867). Widespread, Alive.
Struthiolaria papulosa papulosa (Martyn, 1784) (A) Dead.
Struthiolaria (Pelicaria) tricarinata (Lesson, 1830) (E) Alive.
Tanea zelandica (Quoy & Gaimard, 1832) (A) Dead.
Uberella denticulifera (Marwick, 1924) (C) & (D) Alive.
Globisinum drewi (Murdoch, 1899) (C) Dead.
Xenophalium (Xenogalea) abernetheyi (Dell, 1956) (E) Alive.
Xenophalium (Xenogalea) hamiltoni (Powell, 1928) (B), (C) & (D) Alive.
Xenophalium (Xenogalea) pyrum (Lamarck, 1822) (B) Alive.
Charonia capax (Finlay, 1926) (A) Alive.
Argobuccinum tumidum (Dunker, 1862) (A) Dead.
Fusitriton laudandum (Finlay, 1926) (B) Alive.
Ranella multinodosa (Bucknill, 1927) (E) Alive.
Poirieria zelandica (Quoy & Gaimard, 1833) (E) Alive.
Zemitrella sp. Dead.
Euthrenopsis venusta (Powell, 1929) (B) Alive.
Penion mandarina (Duclos, 1831) (A) Dead.
Penion ormesi (Powell, 1927) (C) Alive.
Penion adusta cf. *mandarinoides* (Powell, 1927) (C) Alive.
Penion adusta cf. *worthyae* (Powell, 1947) (C) Alive.
Aeneator otagoensis cookianus (Dell, 1956) (C) Alive.
Iredalula venusta (Powell, 1934) (C) Alive.
Austrofusus chathamensis (Finlay, 1928) (C) & (B) Alive.
Austrofusus glans (Roeding, 1798) (B), (C) & (D) Alive.
Coluzea spiralis (A. Adams, 1856) (E) Alive)
Baryspira mucronata (Sowerby, 1830) (E) Alive.
Baryspira novaezelandiae novaezelandiae (Sowerby, 1859) (E) Alive.
Austromitra angulata (Suter, 1908) Dead.
Alcithoe calva (Powell, 1928) (B), (C) and (D) Alive.
Alcithoe cf. jaculoides (Powell, 1924) (B) & (E) Alive.
Alcithoe larocheri (Marwick, 1926) (C) Alive.
Alcithoe swainsoni swainsoni (Marwick, 1926) (A) Alive.
Alcithoe (Leporemax) fusus fusus (Quoy & Gaimard, 1833) (A) & (E) Alive.
Micantapex angustatus (Powell, 1940) Dead.
Aoteadrillia cf. *wanganuiensis chordata* (Suter, 1908). Widespread, Alive.
Antimelatoma cf. ahiparana (Powell, 1942) Dead.
Antimelatoma buchanani maorum (E. A. Smith, 1877) Alive.

Maoritomella orientalis (Dell, 1956) Alive.
Splendrillia aoteana (Finlay, 1930) Alive.
Splendrillia otagoensis (Powell, 1942) Dead.
Phenatoma novaezelandiae (Reeve, 1843) (A) Dead.
Antiguraleus otagoensis (Powell, 1952) (C) Alive

SCAPHOPODA

Dentalium (Antalis) nanum (Hutton, 1873) Dead.
Fissidentalium (Fissidentalium) zealandicum (Sowerby, 1860) Dead.

CEPHALOPODA

Robsonella australis (Hoyle, 1885) Alive.
Sepioloidea pacifica (T. W. Kirk, 1882) Alive.

Some Aids in the Collection of Smaller Terrestrial Mollusca and Arthropoda

By R. A. CUMBER, Palmerston North

One's ability to sample as fully as possible the mollusca or arthopods in any particular locality is closely related to the techniques adopted, especially when the time available is relatively limited.

Many of us, from time to time, find ourselves in areas where we would like to collect as many of the existing species as possible from the particular patch of bush, but because of limited time are only able to take a cursory glance and have to leave or bypass such areas with a certain feeling of dissatisfaction. Often the weather is against us, the lighting is poor, or the bush excessively wet.

The purpose of this present article is to assist in enabling us to get as much as possible from those limited hours which we enjoy in the field.

The equipment and methods about to be described were designed originally for insect collection work, but they have proved so efficient for small snail collecting that it seemed worthwhile describing them in this connection.

THE BEATING SHEET Fig. 1

The design of this is clearly shown in Fig. 1. Hardwearing cloth, preferably not waterproofed, is used to give a sheet approximately one yard square. Triangular pockets are sown on at the corners to take the supporting cross pieces of "half round" wood, which are held together where they cross with a thumb-screw. The sheet is sprung on to the cross pieces as required. When collapsed the cloth sheet may be retained on two opposite corners, the cross pieces closed together and the cloth then rolled round the cross pieces for portability.

In use this beating sheet is held by one of the cross pieces — frame uppermost so that the material gathered onto the sheet causes it to belly beneath the framework. Such material may be bounced and shaken on the sheet and the uppermost coarse material discarded, thus concentrating a finer fraction which is rich in small snails and insects, etc.

HOLDING BAGS Fig. 2

Holding bags are best made of cloth. Plastic bags may also be used, but if there is a tendency for the sample to be wet, the cloth bags aid drying out during the period before examination. The transfer of samples from sheet to bags is easier if the bags have fairly wide mouths. Strong rubber bands are ideal for closing off the bags.

LABELS Fig. 3

Tin foil labels are available from those people who handle nursery supplies. These can be written on by using an old ball point pen or lead pencil, the impression remaining quite legible despite rough treatment. The method is quick and ensures that there is never any doubt as to the identity of the sample.

When sampling an area the following sites have proved worth investigating.

ASTELIA and FREYCINETTIA

We are all familiar with these bushes and know that they gather rubbish about their leaf-bases. Gloves are useful to prevent cut hands when shaking these vigorously over the beating sheet.

NIKAU HOLD-UP

The leafy rubbish held up in accessible low-growing Nikaus is extremely rich in species, and has the advantage of often being fairly dry when the rest of the bush is wet.

NIKAU LEAF-BASES

These, whether still attached to the palm or lying on the ground are excellent sources. One thing which snails and insects like is some stability in conditions or dampness, and the Nikau bases allow them to seek the conditions which they desire. When examining these, the beating sheet is placed on the ground. The leaf bases are brought over the sheet with a minimum of disturbance and shaken sharply. Another very useful hint is to make a small brush by gathering about a dozen fern tips and securing them with a rubber band (Fig. 4). This brush may be used to dislodge any closely adhering species.

RUBBISH HELD UP IN THE CROWNS OF FALLEN TREES, ENTANGLEMENTS, etc.

These often yield species which are obtained only with difficulty when using other methods.

LOW-GROWING DENSE FERN THICKETS ON MARGINS

Ferny material near ground level is often rich in some species.

FOREST FLOOR

Leaf mould from the general forest floor, odd pockets beneath Pungas, from between low-growing ferns and grasses will provide further species.

This covers the majority of sites which one may beat or from which one may obtain material for beating sheet separation. One obvious site, namely rotting logs has not been mentioned. However, small pieces of wood, bark, etc., may be brushed onto the sheet. The great advantage of this beating sheet technique is that it releases more time for log, stone, and ground examinations.

The methods described above enable one to work under conditions of poor light. Even under wet conditions it is possible to obtain samples from drier parts, but they will not be so rich as those taken under drier conditions when it is possible to concentrate the samples.

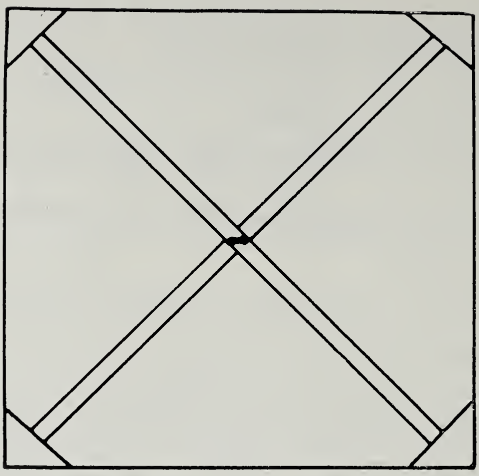
If one is keen to obtain an insight into the ecology of the different species, then one may keep the samples from each site separate. This is to be recommended where possible.

On arriving back with the samples the procedure is straightforward but the work is time-consuming. The following remarks are concerned with the treatment of molluscan material. The collection of insect material involves more complicated processes such as the use of a Berlese funnel.

If the material is stored in cloth bags, the drying out continues. It is necessary to reach a certain dryness if the shells are to be recovered easily. Samples should be laid out on sheets of paper, or placed in situations where they become dry enough to discourage snail movement as which stage they drop when the leaf is disturbed. The material should then be sieved into three fractions, for it is much easier for the searcher to examine fragments of the one size. A good powerful light and a tray which does not reflect light will assist the searcher.

The shells should be transferred to tubes of 80 to 90 per cent. alcohol, keeping a surplus of alcohol where there is any bulk in the collection — this to guard against dilution by animal matter. Those with a light touch may prefer to use forceps in handling the material, whereas others will prefer a fine brush.

Shells should remain in alcohol for about a week, and then



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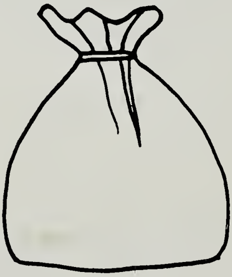

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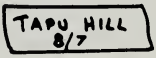
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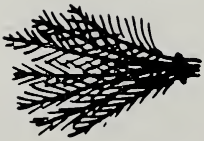

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FIGURES:

1. Beating Sheet.
2. Cloth bag held with rubber band.
3. Tinfoil label.
4. Fern brush.

may be tipped into petri dishes. At this stage a brushing, while still in the alcohol is useful for dirt removal. They should then be removed to petri dishes containing filter paper or blotting paper. If the lids of the petri dishes are left ajar, the air will circulate and most of the dust will be kept out. After about three weeks the animals in most of the shell will have shrunken to insignificant proportions, and the radula is still there for the more venturesome.

It is very important to make sure that the drying out is complete before tubing because of mould risks, although where tubes are plugged with cotton-wool stoppers this allows the drying to continue.

To give an indication of the efficiency of the above collection methods here as some results.

Tapu Valley, Coromandel Peninsula, 8.7.58, conditions atrocious — extreme wet, 3 hours, 37 species.

Clevedon, 9.7.58, conditions overcast but bush dry, 2 hours, 33 species.

Ness Valley, Hunua, 9.7.58, heavy rain, bush fairly dry beneath, 1 hour, 30 species.

The Columbellidae of New Zealand

Part 1

Zemitrella (Finlay, 1926)

By A. K. HIPKINS, Auckland

In this article I intend to follow the same plan as in my previous articles. I shall re-illustrate the figures of the holotypes, where possible, as some of the original illustrations were not satisfactory, and also reproduce the original description of each species. To these I will add some notes and observations of my own.

The genus *Zemitrella* is a particularly attractive one, and with the possible exception of a few species, has a wide and varied colour pattern in individual shells from any given locality. Many of the species are of microscopic dimensions, while others are quite large for the genus. With the exception of three species here illustrated, these shells may be found by the collector who has good eyesight, or a strong magnifying glass, and infinite patience.

Shell sand is one of the best sources of supply, while stone washings will provide the live material.

Zemitrella laevigata (Suter, 1908) Fig. 1

"Shell small, thin, translucent, elongately oval, smooth, faintly shining, white. Sculpture confined to a few oblique ridges on the lower part of the base. Colour yellowish-white, sometimes faintly marbled with pure white. Spire elevated conic, about the same height as the aperture; outlines almost straight. Protoconch of 1½ smooth porcellanous and polished whorls, the nucleus a little oblique. Whorls 5, regularly increasing, lightly convex, the last rounded and contracted at the base. Suture deep. Aperture subvertical, high and narrow, lightly channelled above, and with a very short widely open canal below. Outer lip lightly curved, sharp, but little thickened. Columella vertical, with a deep-seated oblique fold at the base. Inner lip very narrow and thin, extending over the flattish parietal wall. Operculum unknown.

Diameter, 1.8 mm.; height, 4.1 mm.

Type in my collection.

Hab. — Five miles south of Cuvier Island, in 38 fathoms, type (Captain Bollons); off Great Barrier Island, in 110 fathoms."

NOTE:— The illustrated specimen is a lectotype, selected from a series of shells which Suter named as the type. The outer lip of the shell is slightly damaged. The specimen was loaned to me through the generosity of the Geological Survey, Wellington. I have collected a specimen of this species from 18 fathoms, N.E. side of Stephensons Island, about 1½ miles off Taupo Bay, Whangaroa, North Auckland. Aupourian.

Zemitrella finlayi (Powell, 1933) Fig. 2

"Shell elongate, oval. Whorls 5, including typical protoconch of two smooth papilate whorls. Spire tall, conical, one and a fourth times height of aperture. Body whorl narrow, almost cylindrical. The only sculpture consists of eight closely spaced spiral striae at the anterior end of the body-whorl. Colour yellowish-brown, with a narrow white line below the periphery *(sic)* and a spiral series of widely spaced dots just below, while on the sculptured anterior end there is a further series of white dots.

In some of the parotypes, there is in addition a peripheral series of white dots on the body-whorl and in a few others all three white zones are more or less connected axially by zig-zag white lines. Base of pillar with a very weak oblique plait, which is most distinct in half-grown shells.

This species differs from *chaova* in having a less inflated body-whorl and fewer spirals on the anterior end.

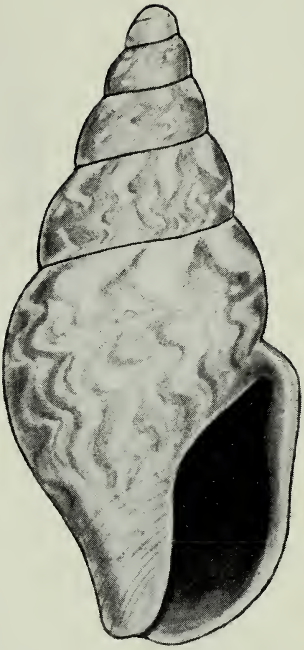
Height, 4.0 mm.; diameter, 1.7 mm. (holotype).

Habitat: Waitangi, Chatham Islands, in shell sand."

I know of no other records of this species.

Zemitrella stephanophora (Suter, 1908) Fig. 3

"Shell small, ovoid, smooth and polished, translucent, yellowish, with two spiral bands of brown zig-zag lines on the body-whorl. Sculpture consisting of a few close spiral threads upon the short neck. Colour yellowish-white, and fulvous zig-zag markings on the lower half of the later spire whorls and continued on the periphery of the body-whorl, a second similar spiral band on the base. Spire rather short, conical, a little higher than the aperture; outline faintly convex. Protoconch papillate. Whorls 5, regularly increasing, flatly convex, the last ventricose and rounded; base somewhat contracted. Suture not much impressed. Aperture narrow, angled above, not much narrowed below, and without a distinct canal. Outer lip straight above, rounded below, smooth inside. Columella subvertical, lightly turned to the left below. Inner lip very narrow and thin, smooth, spreading over the straight parietal wall. Operculum unknown.



3a *Zemitrella stephanophora* (Suter) Leigh specimen.

Diameter, 2.4 mm.; height, 4.5 mm.

Type in my collection.

Habitat. — New Zealand, exact locality unknown (E. A. Annett)."

NOTE: The type specimen is a beach worn shell, which has the outer lip of the aperture rather badly broken, although at first glance it appears naturally smooth closer inspection shows that it has been rounded by the action of sand and water. Also the protoconch, described by Suter as being "papillate," does not exist in the type. This only shows the third whorl, which has been worn smooth. Even supposing the shell were complete this type specimen is of small stature. I have, for more accurate identification included an illustration of a specimen from Leigh, on the east coast, north of Auckland. This is the usual form of *Z. stephanophora* to be found in the North Island (Fig. 3a).

Height of Leigh specimen (7 whorls), 8.0 mm.;
diameter, 4.5 mm.

Localities: Leigh; Whangaruru, to the south of the Bay of Island; Tauranga, Bay of Plenty.

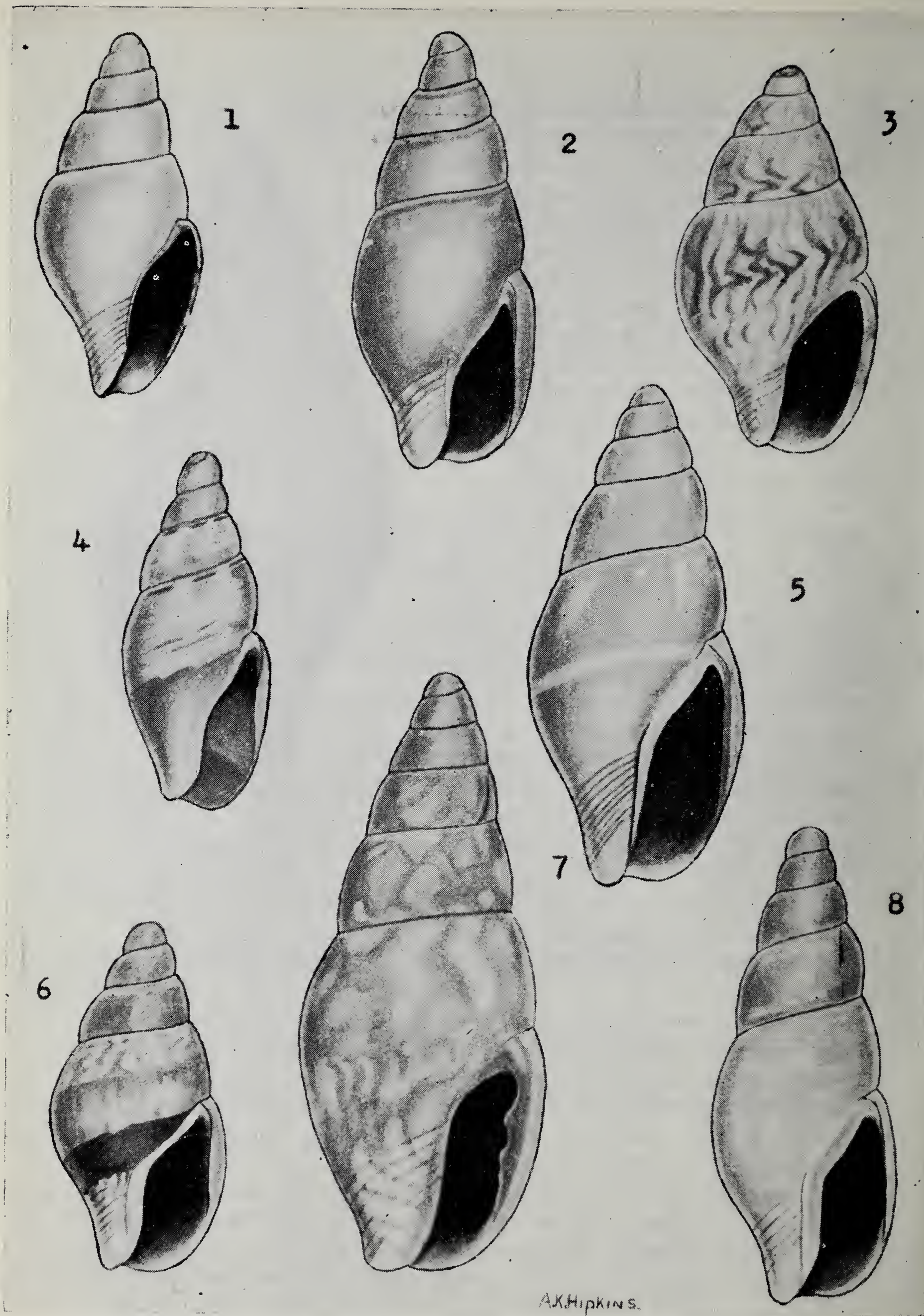


Fig. 1 *Zemitrella laevigata* (Suter) (Lectotype).
2 *Zemitrella finlayi* (Powell) (Holotype).
3 *Zemitrella stephanophora* (Suter) (Holotype).
4 *Zemitrella laevirostris* (Powell) (Holotype).
5 *Zemitrella chaova* (Reeve) Whangaroa specimen.
6 *Zemitrella fallax* (Powell) (Holotype).
7 *Zemitrella pseudomarginata* (Suter) (Lectotype).
8 *Zemitrella attenuata* (Powell) (Holotype).

Type loaned to me through the generosity of the Geological Survey, Wellington.

Zemitrella laevirostris (Powell, 1940). Fig 4.

"Shell small, elongate, smooth and polished, without sculpture, even on the neck, which lacks the characteristic spiral grooves. Whorls 4½, including a papillate smooth protoconch of 1½ whorls. Spire slightly taller than aperture. Whorls evenly accurate, suture impressed. Outer lip scarcely thickened, but with a distinct shallow subsutural sinus. Colour light golden and reddish-brown, patterned on a white ground. Pattern variable; the holotype has the protoconch and the first whorl light reddish-brown; succeeding whorls with a substantial collar of reddish-brown blotches and and an interrupted narrow band of the same colour as well as a diffused general pattern of horizontal to slightly oblique streaks of light brown and pale grey; the whole of the base is almost uniformly light golden brown. Aperture whitish within, except over the lower third, where the basal colour shows through.

Height, 3.3 mm.; diameter, 1.35 mm. (holotype).

Holotype in Auckland Museum.

Locality: Tom Bowling Bay, Northern N.Z. (in shell sand).

This species is characterised by its slender simple outlines and the total absence of grooves on the neck."

NOTE: This species appears to be restricted to the far north and is quite rare. I have one record from Spirits Bay.

Zemitrella chaova (Reeve, 1859). Fig 5.

"Shell very small, elongated, smooth, fulvous or dark brown with variable colour-makings. Sculpture consisting of a few spiral ridges on the lower part of the base only; growth lines very fine and almost straight. Colour very variable: (a) dark brown without any markings; (b) dark brown with a pale band below the periphery of the body-whorl; (c) dark brown with a band below the suture on all whorls except the protoconch, and a peripheral band on the body-whorl; (d) with distant triangular white spots below the suture on the last three whorls, sometimes accompanied by a band below the periphery of the last whorl, composed of close white spots; (e) yellowish or greenish-white with longitudinal flexuous brown lines — they form a brown peripheral band on the spire whorls and on the base of the body-whirl. Epidermis thin, but faintly shining. Spire elevated and narrowly conic, of the same height as the aperture or slightly higher, outlines straight or very lightly convex. Protoconch of 1½ smooth whorls, nucleus depressed, globose. Whorls 6, regularly increasing, but faintly convex; base slightly contracted below. Suture linear. Aperture subvertical, narrow, moderately channelled above, open and truncated below, slightly notched. Outer lip somewhat thickened and smooth or crenate within, straight, and curved towards the base. Columella straight, a little twisted below. Inner lip narrow, with a sharp free edge in adult specimens. According to Hutton there is no operculum. ....

Diameter, 3 mm.; height, 6.5 mm.

Type in the British Museum (Cumming Collection).

Habitat. — Throughout New Zealand, under stones and on seaweeds, near low-water mark to a depth of about 20 fathoms.

REMARKS. — The specimens from deeper water are much smaller, the height sometimes not more than 4 mm. Hutton's *P. flexuosa* is the colour variety mentioned under (e). The operculum and also the central tooth of the radula being usually very small, they may have been overlooked. Iredale found constantly a dark shell paired with a light one, and thinks that the change of colouration in this species may be a sexual characteristic."

For reference to the animal and the dentition, see Suter's "Manual of N.Z. Mollusca" p.432.

NOTE: Specimens of *Z. chaova* from five localities show denticles within the aperture, usually numbering four, and it appears that this is the more common form to be found. Localities: Takapuna Beach (shell sand); Russell, Bay of Islands (under stones, low water); Taipa Beach, Northland (shell sand); Narrow Neck, Auckland (under stones, low water); Leigh, North Auckland (under stones, low water). As there was no type, or paratypes, available, I have illustrated a specimen from Whangaroa, Northland, (under stones, low water).

Zemitrella fallax (Powell, 1940). Fig. 6.

"Shell small, ovate-elongate. Whorls 4½, including a papillate smooth protoconch of 1½ whorls, the apex slightly tilted. Spire same height as aperture. Whorls generally rounded, sutures lightly impressed. Surface smooth and glossy, the only sculpture being seven spiral grooves upon the neck. Outer lip smooth, somewhat thickened but not dilated; there is a subsutural broad shallow sinus. Colour light golden and darker brown on a white ground. Pattern variable; the holotype has the spire whorls light golden brown, lighter on the apex and at a narrow subsutural band; body whorl mottled light brown; base with a broad subperipheral band of darker brown and faint mottling over the grooved neck; inside of aperture mottled greyish corresponding to the external pattern.

Height, 3.1 mm.; diameter, 1.52 mm. (holotype).

Holotype in Auckland Museum.

Locality: Tom Bowling Bay, Northern N.Z. (in shell sand).

The species is nearest to *stephanophora* (Suter, 1908), but is of smaller size and lacks the expended lip of that species."

NOTE: Further localities for this species: Kemps Beach, Leigh, North Auckland (shell sand); McGregors Bay, Whangarei (shell sand); Whangaruru, south of Bay of Island (shell sand); Spirits Bay, Northland (shell sand); Takapuna Beach, Auckland (shell sand). This species seems to be quite common in the North.

Zemitrella pseudomarginata (Suter, 1908). Fig. 7.

"Shell small, subulate, smooth and polished, translucent, whitish with light brown zigzag markings. The only sculpture consists of a few spirals on the neck of the base. Colour yellowish-white with fulvous zigzag markings interrupted on the body whorl by a narrow whitish spiral band below the periphery; lower part of base white. Spire high, acuminate, conic, about 1½ times the height of the aperture; outlines .straight. Protoconch papillate, of 1½ smooth wohrls. Whorls, 6, regularly increasing, flat; body-whorl lightly convex, contracted below. Suture linear, false-margined, as in very often the case in *Eulima*. Aperture slightly oblique, narrow, sub-channelled above, but little narrowed below, without a canal. Outer lip vertical, rounded below, thickened and dentate within. Columella vertical, slightly bent to the left below. Inner lip narrow and smooth, very thin on the straight parietal wall. Operculum unknown.

Diameter, 2.75 mm.; height, 6.6 mm.
Type in my collection.
Habitat. — Bay of Islands."

NOTE: Other localities: Leigh, North Auckland (shell sand); Whangaroa Harbour, Northland (dredged 9 fathoms); Waiwera, North Auckland (underside of stones, low water); Takapuna Beach (under stones, low water); Kawau Island (under stones, low water); Karaka Bay, Great Barrier Island (under stones, low water); Whangaruru, south of Bay of Islands (shell sand); Russell, Bay of Islands (under stones, low water); Houhora Heads, Northland (shell sand); Orewa Beach, North Auckland (shell sand); Okupu Point, Great Barrier Island (shell sand).

The illustrated specimen is a lectotype, loaned through the generosity of the Geological Survey, Wellington.

Zemitrella attenuata (Powell, 1940). Fig. 8.

"Shell small attenuate, smooth, but not highly polished Whorls 5½, including a typical papillate smooth protoconch of 1½ whorls. Spire 1¼ times height of aperture. Whorls gently rounded, suture lightly impressed. Sculpture consisting of five evenly spaced spiral grooves on the neck. Outer lip smooth, only slightly thickened, and with a distinct broad shallow subsutural sinus. Inner lip distinct, marked off vertically across the neck by a sharp edge to the callus. Colour buff with revolving irregular series of white elongate flecks showing through; on the body whorl the prevailing buff tint deepens to light brown and terminates sharply at the upper spiral groove. Interior of aperture uniformly pale buff.

Height, 4.4 mm.; diameter, 1.65 mm. (holotype).
Holotype presented to Auckland Museum.
Locality: Off Three Kings Islands in stomach of fish (Captain J. Bollons).

The species is characterised by its attenuate simple shape, few grooves on neck and simple pattern of white flecks on a buff ground."

NOTE: I know of no other records of this species.

ACKNOWLEDGMENTS: I express my grateful thanks to Mr T. P. Warren, who assisted me by supplying further locality records of the species here mentioned. Special thanks are due once again to Dr. A. W. B. Powell who has, as in the past, given me every assistance, in checking material and supplying holotypes from the Museum collection for illustration, even though these have already been admirably illustrated by him elsewhere.

I wish also to express my grateful thanks to the Director, Dr. L. I. Grange, of the Geological Survey, Wellington, for the loan of a holotype and two lectotypes from the Suter Collection.

REFERENCES:

SUTER, H. "Manual of N.Z. Mollusca" and "Atlas of Plates." P.431, pl.19 fig.13; p.433, pl.19 fig.16; p.435, pl.19 fig.18.

POWELL, A. W. B. "The Marine Mollusca of the Aupourian Province, N.Z." Transactions of the Royal Society, N.Z., Vol. 70, pp.211-238.

POWELL, A. W. B. "The Marine Mollusca of the Chatham Islands." Records of the Auckland Institute and Museum, Vol. 1, pp.181-208.

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An Octopus Observed at Stewart Island

By ELSIE SMITH, Stewart Island

6th July, 1958. The Octopus was feeding among small weed-covered rocks inside the wharf at Golden Bay, Paterson Inlet, in about four feet of water. It was watched from the wharf above for a period of about three-quarters of an hour, on a clear sunny afternoon with no wind.

The animal's body would measure about 12 inches by 9 inches, and was broader behind than in front. The dorsal surface was covered with large tubercles, produced into a pointed tongue shape about 2 inches in length, the largest pair being situated on the middle of the back a little towards the head. The tentacles I judged to be about 4 feet in length. The upper parts of the tentacles and web were ornamented with round white spots, and the suckers were stark white against a dark background. The colour kept changing frequently and very rapidly from olive-brown to very pale blue-grey; but the dorsal tubercles remained brown throughout.

Now and then the Octopus would spread the web of its upper tentacles into a thin, shining, blue-white sheet, covering an irregular-shaped area a yard across, with the dark-coloured body exposed but the tentacles completely hidden beneath. It would remain in the this position for about five minutes, then the web would disappear and the tentacles resume their exploring among and under the rocks. The action of a tentacle in reaching a comparatively distant spot, seemed to be to throw itself backward with the suckers uppermost, then more or less unroll itself towards that spot. Occasionally it would move from one place to another.

The Octopus was camouflaged, both by its colour, and the fact that the body, with its long tubercles waving in unison with the surrounding sea-weed, looking extremely like a solid clump of dark coloured weed itself. Later when we dropped large stones on it, in the hopes of seeing it swim, it shrank back motionless among the rocks and became indistinguishable from its surroundings. The tentacles were withdrawn out of sight; the body with the tubercles shrunken and motionless, looked exactly like a lump of Foveaux Strait "Foul bottom" of the fishing grounds (Cellepora), and the upper part of a tentacle or two, all that was visible, resembled a smooth rock with small white incrustations.

We presumed that the Octopus was collecting small crabs, which are very numerous under these rocks, and that when it had procured enough, it consumed them under the covering web. We noted that no attention was paid to several small fish that swam near, nor to a couple of beche de mer that it passed by.

Octopus maorum is common in Stewart Island waters, and is often brought up on the fishing lines and in the crayfish pots. The tentacles are cut down and used as bait on the lines. So far as I have been able to find out none have been caught that have the elongated dorsal tubercles of the specimen described above.

Some Molluscs from Whangaruru, North Auckland

By PHIL WARREN, Leigh

In February, 1956, my wife and I spent a weekend with Mr and Mrs George Worthy at Whangarei, and on Sunday we decided to spend a day at Whangaruru, where we found to our delight that a good many small shells were to be found washed up on the beach.

At the settlement there is a long stretch of fairly fine sand bounded to the north and south by rocky headlands with a small reef or two. These would probably be well worth investigating during spring tides; unfortunately the day we were there the tide did not go out far at all. At low tide level on that day we found three species of bivalves to be quite common — *Dosinia subrosea, Amphidesma australe* and *Chione stutchburyi,* the latter being in great demand by a party of Maori folk who were picnicking in the vicinity. Some good specimens of all these shells were put in the bag.

Of the washups the most common shells were *Neoguraleus* species, those collected being *N. interruptus, N. tenebrosus, N. whangaroaensis, N. murdochi and N. sandersonae.* One or two *Liracrea* and *Phenatoma zelandica* were also picked up.

In great abundance also was *Marginella pygmaea.* Others of this family found there were *M. cairoma, M. mustelina,* and one *M. maoriana* in rather worn condition, but quite a takeable specimen.

Another pleasing discovery was *Pteronotus eos,* one adult and three juveniles, all with good protoconchs, showing the free swimming larval stage, not unlike juveniles I have seen of *Lepsia haustrum.* Other Muricid discoveries included a small *Poirieria zelandica,* many *Xymene plebejus,* some *Axymene corticata* in quite clean condition, and a few juvenile *Zeatrophon ambiguus.*

We found a *Pupa kirki* in good condition, and though we kept our eyes well peeled for *Bullinula lineata* we did not see any. This species does occur up there as Mrs Worthy once went collecting across the harbour at Bland Bay on the seaward coast, and had the good fortune to find three or four washed ashore.

The pretty little limpet, *Asteracmea suteri,* was quite common, as were good specimens of *Patelloida corticata* and *Radiacmean inconspicua,* though these were somewhat faded to a brownish-white colour.

Very many small specimens of *Sigapatella novaezelandiae* and *Zegalerus tenuis* were seen, as well as *Maoricrypta costata.*

We collected a few immature specimens of *Lamellaria ophione* and a small *Philine* which is most probably *P. auriformis*. I came across two or three small brown shells with a peculiar looking apex. Closer examination showed that they are small specimens of *Fusus mestayerae*, a species I have found to be rather elusive in most localities.

Trochus species are represented by *Trochus tiaratus, Micrelenchus sanguineus*, and *M. rufozonus*, the latter species being the most abundant. The comparative scarcity of seaweed and stones would no doubt have something to do with the dearth of Trochoids in this area.

The family Columbellidae, on the other hand was well represented. I have sorted out quite a number of good examples of *Macrozafra subabnormis* and its subspecies *saxatilis*, one *macrozafra nodicincta* and another which is at present uncertain. *Paxula paxillus* is quite common, but no *P. murdochi* were seen. Four species of *Zemitrella* occur there: *Z. chaova* and *Z. pseudomarginata* are common enough: *Z. stephanophora* 3 adults and a juvenile; *Z. whangaroaensis*, a single immature shell which I am sure is this species.

A few land molluscs were washed up at the high tide line, having probably been washed down from a patch of bush we could see to the north of the harbour. Some rather bleached specimens of *Liarea turriculata* were there, and a few *Laoma poecilosticta* and *Ptychodon varicosa*. I hoped I might see *Delouagapia cordelia* and perhaps even a *Placostylus*, but no such luck.

However, were were well pleased with our day's outing, and we all look forward to a return visit there as soon as were are able to do so.

A Number-Code for Dr. Powell's Check-List of N.Z. Recent Mollusca

By DR. J. E. ROSENBAUM, Auckland

In the latest edition of "Shells of New Zealand" Dr. Powell had to give up numbering the check-list. While this is unavoidable in view of the likelihood of further additions, it deprives one of a simple aid in keeping one's collection in order. I have therefore worked out a code, which I hope may be helpful to others:

PELECYPODA—

Number the families from 10 for Solemyidea to 55 for Cuspidariidae.

Number the genera within each family from 10 onwards Number the species within each genus from 10 onwards Each species will then have a code number of six digits: eg. *Dosinia anus* 391013.

GASTROPODA—

The system will have to be different as the number of families is 131. Therefore we number the families from 1. for Scissurellidae to 131. for Athoracophoridae.

Number the genera within a family from 10 onwards, and the species within a genus from 10 onwards. The fullstop after the number denoting the family is advisable, to avoid any mix-up between code numbers for bivalves and gastropods.

The code number for *Neoguraleus huttoni* would be 76.2713, for *Trochus tiaratus* 7.1011, and for *Rhytida dunniae* 129.1012.

AMPHINEURA—

For these molluscs a 3-digit number would do; from 111 for *Ischnochiton circumvallatus* to 744 for *Onithochiton subantarcticus,* as long as no new species of *Notoplax* are found.

The disadvantage of the code — namely that one cannot see at a glimpse whether a species is not yet represented in the collection — is counter-balanced by its elasticity. No amount of splitting and no number of new additions would exhaust its possibilities.

New Records from the Manukau Harbour

By ALBERT H. JONES, Auckland

One of the fascinations of shell collecting is in the ever-present possibility of discovering something rare or unusual, or something new to an area. The writer had such an unexpected pleasure when he collected a live specimen of *Charonia rubicunda* on the western side of Puponga Point, Manukau Harbour, This shell which was found in 1955 was the first record of this species from the Manukau Harbour, although it was later learnt that two specimens had been found the year previously (1954) by a Mr Beveridge who at the time was collecting scallops *(Pecten novaezelandiae rakiura).* Six further specimens have been found by the writer during the past two years. A further three specimens of *rubicunda* and one specimen of *C. capax* were found by a local resident in April of this year. The *capax* specimen is a fine shell. It is a large specimen, measuring 190 mm. by 133 mm., and nicely marked. These latter four shells, with those found by Mr Beveridge in 1954, are in the cellection of Miss M. Gillman.

A specimen of *C. capax*, the first official record of this species in the area, was found on the 5th May of this year by Mr A. K. Hipkins. This shell is a nearly perfect specimen, measuring 190 mm. x 110 mm., has dark brown blotches on a white ground and the usual radial grooves between the nodules. Unlike the specimens of *rubicunda,* which were all from the western side of Puponga Point, Mr Hipkins' shell was found on the eastern side. Mr Hipkins has donated this shell to the Manukau Survey Collection of this Section. This is a noted addition to this useful reference collection.

Both *rubicunda* and *capax* are apparently established in the deep waters off Puponga Point. These waters dropping from 4 fathoms inshore to 16-21 fathoms a little way out, are the deepest in the Manukau Harbour.

One live *rubicunda* was taken at a depth of 10 fathoms off Paratutai, Manukau Heads. This shell was in good condition and nicely coloured. It has an overall measurement of 200 mm. x 113 mm. This specimen was taken by a skin diver, Mr Norman Mander. It is hoped that more specimens will be seen from this area.

The Manukau specimens show a distinct variation in shape when compared with shells from Mt. Maunganui. The latter are generally much broader and more flared at the lip. Two comparable specimens have the following measurements:

Mt. Maunganui specimen—Length 190 mm., breadth 130 mm.

Manukau Harbour specimen—Length 180 mm., breadth 103 mm.

In other respects specimens from the two localities are similar, having the same colouring — rusty brown blotches on a white to cream ground, and similar radial grooves and nodules.

No doubt with the passing of time further specimens of both *Charonia capax* and *rubicunda* will be found in the Puponga Point area, and perhaps from the comparatively unexplored rocky and deep water coast line between Huia and the Manukau Heads.

The frail egg-shell like *Offadesma angasi* is a Manukau "find" worthy of note. One live and several empty but complete shells were found in November 1952 on the triangular bank lying between the main channel and Puketutu Island. These shells were taken from the edges of one of a series of snapper pits, i.e., holes dug by these fish in the search for bivalves, *Offadesma* included evidently — quite a worthy meal for Tamure. Spade work in this area would probably bring this rare shell to light. Throughout a lifetime of living near and on the shores of the Manukau, the writer had not seen this shell before, even as a beach washup. It is not possible to say whether this species is limited to a small area where these specimens were found, or whether it is more widespread.

Panopea zelandica, inhabitant of the deep mud and described in the text books as a coast dweller, would appear to occur in the Manukau Harbour. One half valve of this species was found at Big Bay, at low tide mark during February of this year. Washups of this species sometimes occur after storms on east coast beaches, but apart from these occurrences and occasional specimens from commercial trawlers, the shell is seldom taken alive. The possibility of these shellfish being brought to the Manukau by fishermen to be used as fish bait and the shells thrown overboard seems very remote. It would seem from the above find that this species exists along the bands bordering the Papakura channel, If further specimens come to light later, these would definitely prove the existence of this shellfish in the Manukau.

Complete unbroken Tusk shells, *Dentalium nanum,* were found in quantity surrounding snapper pits at the low spring tide mark at Big Bay. This bay is on the western shores of the Manukau Harbour, about eight to ten miles from the heads and is bordered by the Papakura Channel on the seaward side. The shells found were all dead shells. Probably on being brought to the surface by the snapper digging the animal would die, as they normally lie buried in the mud. Judging by the number found this area would appear to be their natural habitat and the live shellfish may prove to be quite abundant on further investigation. No washups of the species were seen along the high tide mark, as would be expected, considering the numbers seen at the low tide mark. Washups can always be found on the ocean beach at Whatipu. These would probably be carried down with the tide from the banks in the harbour, as they are always in a polished state, due no doubt to wave action and sand abrasion.

Shellfish and Rats

By W. P. THOMSON, Auckland

(These notes have been based upon observations made by Mr E. I. Hollis and Mr A. H. White.)

How is it possible to link "shellfish" and "rats"? That is the natural question which would arise in the minds of most people. But that a very definite association does exist is evident from information supplied by the above-mentioned members of the Conchology Section. It is an association no doubt very gratifying to the rats, but hardly likely to be appreciated by the shellfish.

Mr Hollis reports that, on a recent holiday to Rotorua, he and Mrs Sollis visited Mokoia Island which lies out in the middle of Lake Rotorua. While there they noticed great heaps of empty shells of the fresh-water mussel, *Hyridella menziesi,* lying in places near the lake shore. They also noticed that most of the shells were broken at one end which rather spoiled them as collectors' specimens. Wondering how the shells came to be there in such numbers, and in such condition, they asked the launch proprietor about them, and were amazed at his answer. What he stated was from his own observations and, as he was a University trained man, the holder of a B.A. degree, they may be relied upon.

Great numbers of water-rats live in holes burrowed just above water line on the shores of the island, and he has watched the rats swim away down to the bottom of the lake, even to 8 or 9 feet down, and come up with fresh-water mussels in their mouths. On occasions if the sun happened to be shining, the rats would simply drop the mussels on the ground out in the open, exposed to the sun's rays. They would then just sit back and patiently wait until the shells opened, when in they would dart to make a meal of the animal. Mostly, however, they would be too impatient, or if the weather was not helpful for these tactics, they would break up the shells with their teeth, always attacking them at the posterior end. The launch proprietor stated that to his knowledge the fresh-water mussel was the staple diet of the water-rats on Mokoia Island.

On hearing of the above interesting observation, and seeing some of the shell specimens from Mokoia Island, Mr White was reminded that some years ago, while visiting the Hunua Falls, about 30 miles south of Auckland, he found on a sandbank below the falls quite a number of *Hyridella* shells which had obviously been carried there and opened by rats.

Fresh-water mussels are not the only shellfish diet of the water rats, however, for Mr White also recalled that many years ago he observed above high-water mark on the banks of the Maungamaunga Roa River, near Howick, several heaps containing 50 or more *Amphibola crenata* shells. Every shell had been broken into by rats, and it was quite obvious that they were old hands at the game. The shells selected by them were all just half-grown, apparently because they would be thinner and therefore would be easier to break than adult shells. The break was not at the lip as one might expect, but in every case was about half-way round the body-whorl, right where the animal would be.

It is evident then that water-rats are in the habit of making full use of the plentiful supply of food which is readily available to them in the shellfish found close handy to their haunts; or is it rather that they make their homes close and handy to a plentiful supply of food?

Vertigo Pygmaea (Drap.)

In March 1955, Mr A. K. Hipkins discovered a dead shell of an obviously introduced snail among some shell sand which he had collected from McGregors Bay, near Whangarei. Its occurrence in the sand being no doubt due to its being washed down by a nearby stream. This was noted in my article "Introduced Land Molluscs of N.Z." Bulletin 11 (1955) and the probability of it being a specimen of *Vertigo pygmaea* (Drap.) was suggested. This tentative identification was later confirmed. As far as is known that was the only specimen found in this country until early this year. On 17th February last I collected a bag of rotted leaves from the ground under bush in Mair Park, Whangarei. Among the small snails I sorted out from this material were three specimens of *Vertigo pygmaea*. The occurrence of this species in New Zealand is therefore now confirmed. It is interesting to note that although the majority of snails found in Mair Park bush are endemic species, one of the most plentiful is another introduced species, *Cochlicopa lubricella* (Stabile).

—H. E. WHITTEN.

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The Columbellidae of New Zealand

Part 2

Zemitrella Finlay, 1926 and, *Paxula* Finlay, 1926

By A. K. Hipkins, Auckland

This article is a follow up on last year's, with the same plan as previously. Most of the species here illustrated, may be found under stones, on, or under seaweed, in the low tidal areas, in the Aupourian, Cookian, Forsterian, Moriorian and Antipodean Provinces. As I have mentioned before these shells, make a very attractive display, owing to the almost unlimited variation of decorative patterns and colours.

Zemitrella rosea (Hutton, 1873) Fig. 1

"Shell small subulate, thin, smooth, pink or purple, usually with one or two white spiral bands. The only sculpture consists of a few spiral ridges on the lower part of the base, and very fine straight growth lines. Colour pinkish or purplish-brown generally with a white spiral band below the suture on the spire-whorls and one on the periphery of the body whorl; the neck of the base also white, but sometimes there is a white band above the suture and only 1 central band on the body-whorl, the neck not white; occasionally there are no spiral bands at all. Spire high, acute, conic, about 1½ times the height of the aperture; outlines straight. Protoconch obtuse, of 1½ smooth flatly convex whorls, the nucleus depressed globose. Whorls 6, regularly increasing, but faintly rounded; base flattish lightly contracted. Sature linear. Aperture small oval lightly channeled above, slightly narrowed below, base moderately notched. Outer lip subvertical, convex below, sharp, smooth inside. Columella vertical, very little twisted below. Inner lip narrow, smooth, with a sharp outer edge, spreading as a thin glaze over the flat parietal wall. Operculum unknown.

Diameter, 2.5 mm.; Height 5 mm. (type).

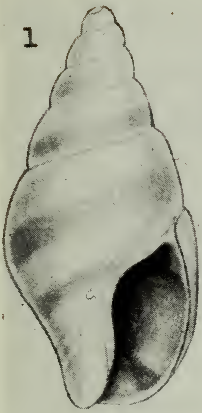
Animal unknown.

Type in the Dominion Museum, Wellington.

Hab.—Stewart Island (type); Hauraki Gulf (H.S.); Cook Strait; Auckland Islands, (Professor W. B. Benham); Snares, in fifty fathoms (Captain Bollons)."

NOTE—As the Lectotype selected by Dr. R. K. Dell, is, unfortunately badly damaged, I have for better identification purposes

1



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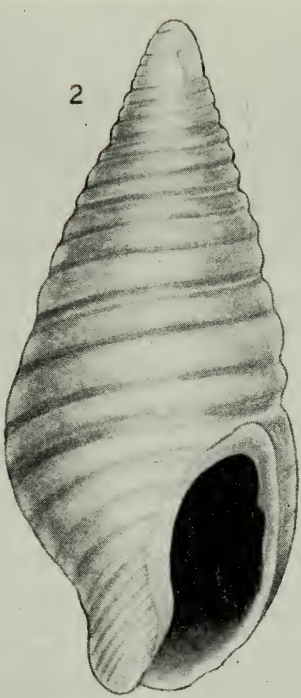

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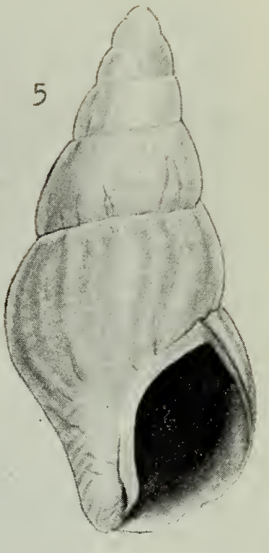

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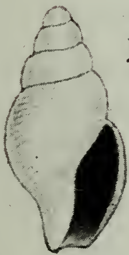

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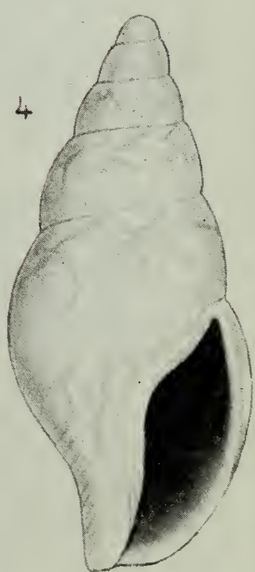

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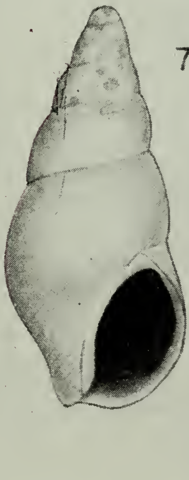

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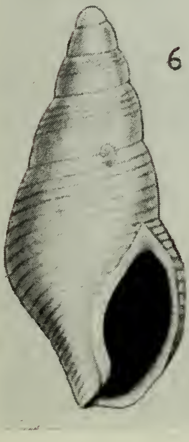


A.K.Hipkins

selected a Topotype from a series generously donated to me by Mrs C. Smith of Stewart Island, which is here illustrated. Further localities; Bounty Islands, (Finlay coll., Auck Mus.); Faith Harbour, shell sand Auckland Islands (Finlay coll. Auck. Mus.); off Leeward Island, Antipodes, 15 fath. (R. K. Dell, Nov., 1950); Galathea Stn. 594, off Perserverance Harbour, Campbell Island, 46 metres. Forsterian.

Zemitrella sulcata (Hutton, 1885.) Fig. 2

"Shell small, oblong solid, spirally grooved or smooth, with a few spiral grooves on the neck of the canal only, or distantly spirally ribbed, the ribs very unequal in number and width; on the penultimate whorl they vary from 2 to 5, and their number may be up to fifteen on the body-whorl; the ribs are flat, usually broad on the spire-whorls, but narrow on the base; the interstices are mostly much narrower than the riblets; the fine growth-lines are distinct only in the moderately deep grooves. Colour light or dark fulvous. Spire elevated conic nearly twice the height of the aperture, outlines straight, sometimes slightly scalar. Protoconch small, papilate, of 2 smooth whorls, dark brown and polished. Whorls 7, regularly increasing, periphery of body-whorl convex; base somewhat contracted. Suture canaliculate. Aperture vertical, oval and lightly channeled above, produced below into a short open and slightly oblique canal, its base moderately notched. Outer lip flatly convex, thickened, with a few small teeth within, the uppermost larger than the others. Columella vertical, straight, and smooth with an oblique spiral fold at its base, distinctly visible on looking up through the canal. Inner lip thin, spreading over the straight parietal wall. Operculum unknown.

Animal unknown.

Type in the Canterbury Museum, Christchurch.

Hab.—Foveaux Strait, in 15 fathoms; dredged Dunedin Harbour (A. Hamilton); Auckland Islands (Professor W. B. Benham); Snares in 50 fathoms (Captain Bollons). Fossil in Pliocene." Forsterian.

Suter, in his manual, gives this shell the name, (Alcira varians) P. 442; and gives the name (Alcira sulcata) to a species of (Paxula); P. 440; this error has been pointed out by Finlay in the Trans. N.Z., Inst. vol 57, in his New Zealand Molluscan Systematics.

NOTE—Unfortunately Hutton, in describing this shell did not mark the type specimen so a Lectotype has been selected by Dr. R. K. Dell, from the available Syntypes, which is illustrated here. Lectotype Dominion Museum Wellington.

Other localities; Leasks Bay, Half Moon Bay Stewart Island (Mrs R. H. Harrison).

Zemitrella websteri Suter, 1913. Fig 3.

Shell very small, elongated oval, spirally striate, thin, white. Sculpture consisting of numerous fine and close spiral cords with linear interstices, extending over the whole of the base, and crossed by fine growth lines. Colour white. Spire conical, its height a little less than that of the aperture. Protoconch papilate, of 1½ smooth and polished whorls. Whorls 4 regularly increasing, lightly convex; base somewhat contracted. Suture well impressed. Aperture elongate, narrow sharply angled above, narrowed below without a canal, base slightly notched. Outer lip thin and sharp, straightened above, smooth within. Columella vertical, straight. Inner lip almost obsolete, the spiral sculpture extending to the interior.

Operculum unknown.

Diameter, 1mm., height, 3 mm., (type).

Type in the Dominion Museum Wellington.

Hab.—Off Great Barrier Island, in 110 fathoms.

Remark—The two specimens obtained in 110 fathoms are evidently not adult."

NOTE—Further records of this specie are as follows; 3 fath., Maria Island, Noises group, and 5 fath. Crusoe Island, Hauraki Gulf. Dr. A. W. B. Powell coll. Auck. Mus.

It seems possible that this speciesc ould be found in shell sand, owing to the fact that it has been dredged in such shallow water. Aupourian.

Zemitrella daemona (Webster, 1906). Fig. 4.

Shell small, fragile, fusiform, smooth, with rufus markings. Sculpture: The second whorl finely axially striated, lower part of the base with about 15 obscure spiral straitions; the whole shell with fine growth-striae. Colour pale cream, dull, with rufous zigzag markings. Spire narrowly conic, of the same height as the aperture; outlines almost straight. Protoconch papillate, the nucleus smooth. Whorls 5, regularly increasing, slightly convex; base flatly contracted. Suter impressed. Aperture subvertical, high and narrow sharply angled above, narrowed below, with a distinct open canal Outer lip lightly arched, thin and sharp, with numerous denticles inside. Collumella vertical, slightly arched, smooth. Inner lip narrow and thin produced over the faintly convex parietal wall. Operculum unknown.

Diameter, 2 mm.; height, 6 mm. (type).

Animal unknown.

Type in the Dominion Museum Wellington.

Hab.—Off Great Barrier Island, in 110 fathoms."

NOTE—I can find no other records of this species having been found. The first two whorls appear in good condition, but suceeding whorls have a chalky texture, and the only sculpture evident, is fine growth striae. Aupourian.

NOTE—The remaining species of *Zemitrella* not illustrated in this paper, which are nine in number, have already been admirably illustrated and described by Dr A. W. Powell, and Dr. R. K. Dell, in publications which I shall mention here for reference purposes.

Powell, A. W. B.	Z. annectans— Z. curvirostris Z. sericea Z. turgida	New Species of Marine Mollusca from New Zealand, Discovery Reports, vol. 15; pp. 153-222.
Powell, A. W. B.	Z. laerostris Z. regis	The Marine Mollusca of the Aupourian Province, New Zealand Transactions Royal Society N.Z., Vol. 70, pp. 205-248.
	Z. constans	Mollusca of the Southern Islands of New Zealand. Cape Expedition Series, Bull. 15, D.S.I.R., Wellington, pp. 1-152.
Dell, R. K.	Z. benthicola	The Archibenthal Mollusca of New Zealand. Dominion Museum Bulletin, No. 18, pp. 1-235.
Dell, R. K.	Z. whangaroaensis—	Some New Off-shore Mollusca from New Zealand. Ihid. 3 (1), pp. 27-29.

Paxula allani Finlay 1928. Fig 5

Like *leptalea* in shape, but more elate, and with a higher spire. The specimens are all worn, and spiral sculpture on the whorls cannot be distinguished, but there are rather stout spiral cords over most of the base, more especially round the neck of the canal. The most characteristic feature of the species is the strong axial sculpture, which is obsolete in all other species of the genus so far described. The penultimate whorl bears 16 stout axials extending from suture to suture on all whorls, and across body-whorl and almost all the base; the ribs are broadly rounded and have subequal interstices. This gives it somewhat the appearance of a *Zafrina,* such as *subabnormis,* but the strong spiral sculpture is lacking, and the aperture of corse is totally different, that of *Paxula* being highly caracteristic.

Height, 6 mm.; Diameter, 2.5 mm. Corresponding dimensions of a larger worn specimen, 8 x 3 mm.

Hab. Chatham Is.

Not uncommon, and apparently restricted to this locality."

NOTE—There are two specimens of this shell in the Finlay Collection, Auckland Museum, but these specimens are so badly worn and damaged, and the type has not been marked, so I have for better identification, illustrated a Topotype, from a series of seven shells collected by Dr. A. W. B. Powell, from Waitangi West, Chatham Islands, February, 1933. This species seems to vary, as to the number of axial ribs, which are mainly confined to the body-whorl. The spiral sculpture is subobsolete on the body whorl, becoming stronger on the neck. Moriorian.

Dimensions of Topotype. Height, 7.5 mm.; diameter, 3.25 mm.

Paxula transitans (Murdoch, 1905). Fig. 6.

"Shell small, subulate, somewhat shining, spirally lirate, brown. Sculpture consisting of close and numerous subequal spiral riblets, the interstices narrow and not very deep, 5 to 8 on the penultimate and 15 to 20 on the last whorl, occasionally one or two riblets, at the periphery of the body-whorl are broader than the others; the whole crossed by irregular fine growth-lines. Colour light or dark brown, olive or reddish-brown, sometimes with a lighter band immediately below the suture and produced around the periphery of the last whorl, but occasionally this band is darker than the ground-colour. Spire high, subulate about 1½ times the height of the aperture; outlines straight. Protoconch of 1½ whorls, smooth and shining, the nucleus globose. Whorls 6, regularly increasing, flattened; base very little contracted, Suture impressed. Aperture oval, acutely angled or subchanneled above, slightly narrowed below, without a canal, base lightly notched. Outer lip simple, uniformly curved, sharp. Columella vertical, very little excavated, smooth, with a basal plait. Inner lip very narrow and thin, extending over the straight parietal wall. Operculum unknown.

Diameter, 2.2 mm.; height, 5.1 mm. (type).

Animal unknown.

Type in the Dominion Museum, Wellington.

Hab.—Whangaroa Harbour, type (C. Trail); Stewart Island; Bounty and Snares Islands, in 50 fathoms (Captain Bollons); Auckland

Islands (Professor W. B. Benham); Campbell Island (Professor C. Chilton). Fossil in Pliocene."

I have collected in the low tidal area at Whangaroa Heads, during a two weeks stay, over a period of five years and I have never come across this species living or dead, and I am of the opinion that the Type locality is in error.

NOTE—Unfortunately, Hutton in describing this shell, did not mark the type specimen so a Lectotype has been selected by Dr. R. K. Dell, from the available Syntypes, which is illustrated here.

Paxula paxilus (Murdoch, 1905). Fig. 7.

"Shell small, subulate, slender, smooth, brown. Sculpture consisting of a few small spirals at the anterior end of the body-whorl; a few irregular microscopic spiral lines may be present on some of the whorls, but very often they are wanting; a few axial riblets, periods of rest, are visible on the spire whorls. Colour light brown or reddish-brown or almost black, the suture occasionally a little lighter. Spire subulate, about 1½ times the height of the aperture; outlines straight. Protoconch of two convex whorls, smooth and polished, papilate. Whorls 5½ to 6, lightly convex, the last lightly angled at the periphery; base very little contracted. Suture impressed. Aperture short, oval, angled above somewhat, narrowed below, but without a canal; base very little notched. Outer lip strongly arched, smooth within, sharp. Collumella lightly arcuate, vertical, somewhat twisted below. Inner lip narrow and thin spreading over the faintly concave parietal wall. Operculum unknown.

Diameter, 2 mm.; height, 5 mm. (type).

Animal unknown.

Type in the Dominion Museum Wellington.

Hab.—Whangaroa Harbour, type (C. Traill); Whangaroa Heads; Takapuna; Manukau Harbour; Kawhia; New Plymouth; Lyttelton Harbour (Iredale). Remark—Specimens I collected near Tamaki Heads are not so slender as the type; adult specimens are 2.5 mm. by 6 mm."

NOTE—Unfortunately Murdoch in describing this shell, did not mark the type specimen, so a Lectotype has been selected by Dr. R. K. Dell, from the available Syntypes, which is here illustrated.

Other localities: Cape Maria van Dieman (beach-drift, Dr. H. J. Finlay collection. Auck Mus.). Half Moon Bay (low-water A. W. B. Powell, 1934).

ACKNOWLEDGEMENTS: I express my grateful thanks to, Dr. R. K. Dell, who so willingly supplied the bulk of the material under

this valued and always willing service, the writer expresses his grateful selected by him as Lectotypes, yet to be published. Also to Dr. A. W. B. Powell who received this material into his care, and also supplied a Topotype, and further localities for the species here mentioned. For this valued and always willing service, the writer expresses his greatfull thanks.

References:

SUTER, H. "Manual of N.Z. Mollusca" and "Atlas of Plates." P. 434, pl. 19 fig. 17; P. 442, pl. 20 fig. 4; P. 436, pl. 19 fig 20; P. 443, pl. 20 fig. 6; P. 441, pl. 20 fig. 3; P. 433, pl. 19 fig. 15.

FINLAY, H. J. "The Recent Mollusca of the Chatham Islands" Trans. N.Z. Inst., vol. 59, 28th March, 1929. P. 257, pl. 14, fig. 38-39.

Charonia Rubicunda (Perry) From The Manukau Harbour

By ALBERT H. JONES, Auckland

Since writing on *Charonia* in No. 14 Bulletin information has come to hand of two further finds of this fine large univalve from the Manukau Harbour. The first a live specimen was taken during the Autumn months of 1958 by Mr Neil Farley of Huia. This shell was taken from *Zostera* grass near the low tide line in the Huia-Kakamatua area. On inspection it proved to be *C. rubicunda* of medium size with the usual colour pattern peculiar to this species.

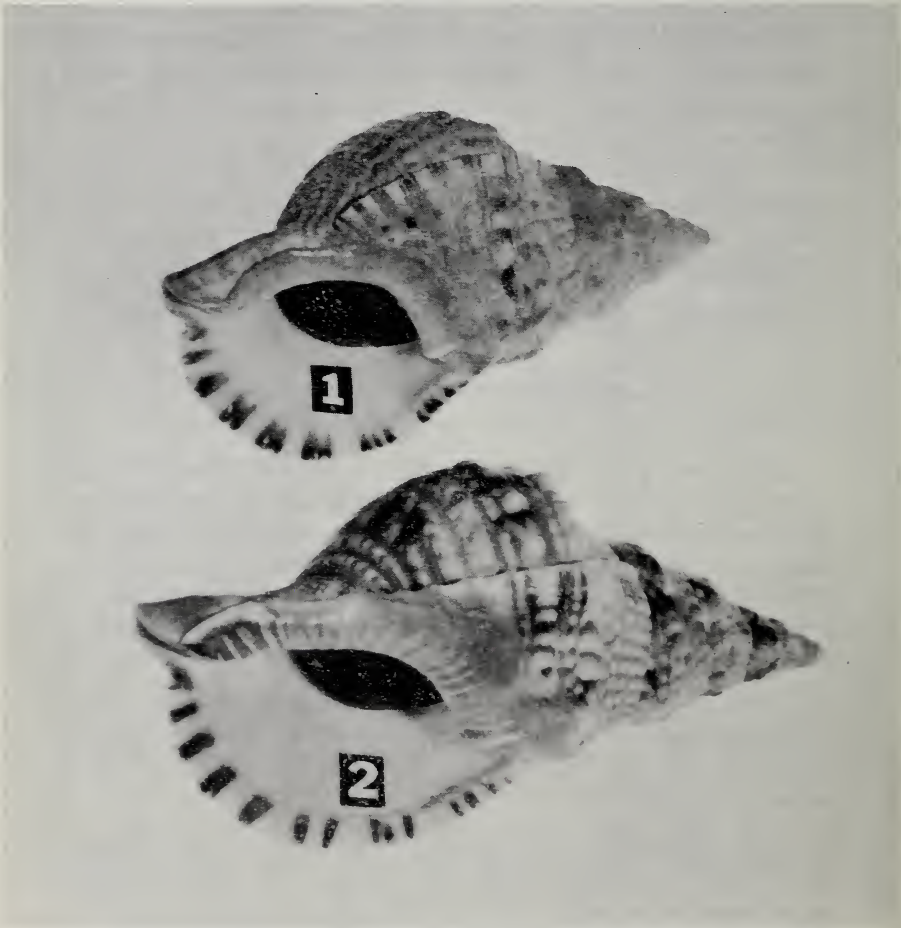
The second shell, also a live specimen, was found along the Huia-Kakamatua coastline by Mr Douglas Farley of Manuerawa. This shell I have not seen, so cannot say at this juncture if this latest find is *rubicunda* or *capax*.

A CORRECTION. The shell taken by skin diver Mr Norman Mander from deep water off Paratutai, Manukau Heads and described as *rubicunda* in my article "New Records from the Manukau Harbour" Bulletin 14, is now housed in my collection. This shell on examination proved to be *capax*. The accompanying figures show this shell as No.

2. The first *C. capax,* to my knowledge to be found in the Manukau. Fig. 1 shows *C. rubicunda,* the first recorded shell of this species to be taken from the Manukau Harbour.

Fig. 1. *Charonia rubicunda* (Perry). The first recorded shell of this species found in the Manukau Harbour.

Fig. 2. *Charonia capax* (Finlay). Shell taken from deep water off Paratutai, Whatipu, Manukau Heads.



(Photos by A. H. Jones).

Field Notes On Some Australian Land Shells Of The Genus Bentosites (Iredale, 1933).

By L. PRICE, Kaitaia.

Following are personal observations on some members of the genus *BENTOSITES,* collected during 1956-7-8.

These shells are found in coastal Queensland from about Maryborough, north almost to Townsville, inhabiting mainly the rain forests, and sometimes thorny scrub. In general, they are of elevated, conical shape, with a strong flaring lip, usually a sealed umbilicus. brightly-coloured, and 1-2 inches in diameter.

(1)—*BENTOSITES BLOMFIELDI (Cox, 1864).*

Shell: Spire very elevated, conical; base flattish; umbilicus not quite closed, showing a slight chink; lip strongly reflected; average diameter 1¾ in; color, a uniform black-brown, shading to yellow-brown on the spire, suture is distinctly margined with ivory, lip and interior purple-black with a blueish sheen. Animal: A uniform grey-black. Habitat: About 6 miles south of Miriam Vale, Sth. Queensland. In rain-forest, under rocks and in hollow logs, abundant.

(2)—*BENTOSITES COXI (Crosse, 1886).*

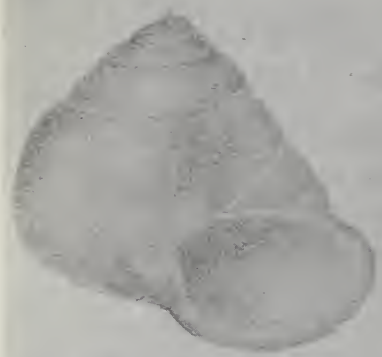
Shell: Spire moderately elevated, globular; base rounded; umbilicus completely sealed; lip strongly reflected; average diameter 1½ ins; Color very pale yellow, with a few narrow light red-brown bands, lip and interior pure white. Animal: A uniform bright orange. Habitat: Gorge on the upper Proserpine River, about 18 miles N.W. of Proserpine, Nth. Queensland. In rain forest, under rocks, scarce.

(3)—*BENTOSITES CROFTONI (Cox, 1872).*

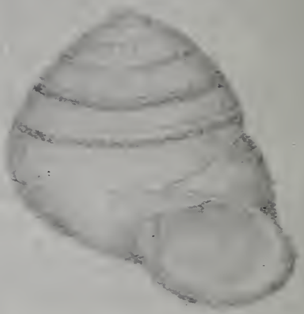
Shell: Spire very elevated, conical; base rounded; umbilicus completely sealed; lip strongly reflected; average diameter 1½ ins; color pale yellow, heavily banded with dark red-brown, the bands very diffused above, narrow and more distinct on the base, with a dark patch around the umbilicus, lip and interior purplish-white, the outer bands showing through dark purple. Habitat: Foothills of Clarke Range, near Wagoora, about 50 miles N.W. of Mackay, Nth Queensland. In rain forest, under rocks, abundant.

(4)—*BENTOSITES ETHERIDGEI (Brazier, 1877).*

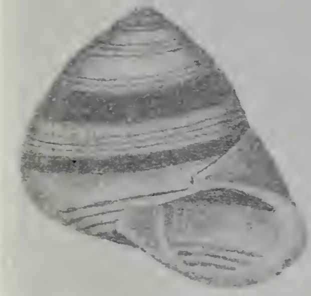
Shell: Spire very elevated, conical; base rounded; umbilicus com-



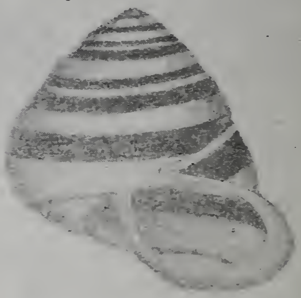
(1) B.BLOMFIELDI



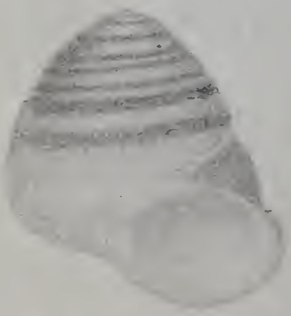
(2) B.COXI



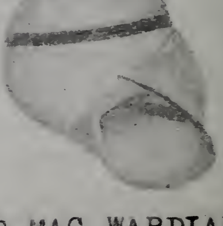
(3) B.CROFTONI



(4) B.ETHERIDGEI



(5) B.GAVISA



(6) B.MAC.WARDIANA

L. PRICE

pletely sealed; lip strongly reflected; average diameter 1½ ins; color deep orange-yellow, distinctly banded with dark chocolate, the bands wide above, narrow on the base, there is a dark patch around the umbiliclus. (This is the normal coloring, but sometimes the color scheme is reversed, the whole shell is then a dark chocolate with a few narrow yellow bands). Always the suture is distinctly margined with white, the lip is pure white, the interior is transluscent white, with the outer bands showing through dark purple. Animal: A uniform deep orange. Habitat: Mt. Blackwood and Mt. Jukes, about 20 miles N. of Mackay, Nth. Queensland. In rain forest, on trunks and branches of trees, specially in knot-holes, up to at least 50 feet, rarely under rocks, abundant.

(5)—*BENTOSITES GAVISA (Iredale, 1933).*

Shell: Spire very elevated, conical; base rounded; umbilicus completely sealed; lip strongly reflected; average diameter 1½ ins; color deep yellow-brown, heavily banded with dark chocolate, the bands very diffused near the aparture, a few faint lines on the base, a dark patch around the umbilicus, the suture is distinctly margined with white, lip dark purple-brown, interior with a blueish sheen. Habitat: Gorge on the upper Proserpine River, about 18 miles N.W. of Proserpine, Nth. Queensland. In rain forest, under rocks, scarce.

(6)—*BENTOSITES MACLEAYI WARDIANA (Iredale, 1933).*

Shell: Spire very elevated,conical ; base rounded; umbilicus completely sealed; lip strongly reflected; average diameter 1¼ ins; color pale yellow-brown becoming darker towards the aperture, with a few dark streaks on the body-whorl, there is a single, medium-thick, purple-brown band at the periphery, lip is dark purple-brown, interior dark brown with the outer band showing through. Habitat: Hayman Island, about 17 miles E. of Cannonvale, Nth. Queensland. In rain forest and thorny scrub, under rocks, scarce.

To conclude, it may be noted that in addition to the above described shells, there are to be found a few more old established species, plus a number of varieties, as yet to be named.

On the off-shore islands, one member of the genus is located as far north as Thursday Island, off the tip of Cape York.

REFERENCE: T. Iredale, "A Basic List Of The Land Mollusca Of Australia" Part II (1937).

Some Wellington Impressions By A North Auckland Collector

By PHIL. WARREN, Leigh.

Last March I was able to get away from the farm for a spell, and decided to go down to Wellington to pay some visits—and to collect, when and where possible. I broke my journey south at Waitomo and enjoyed some good land snail collecting in the bush above the limestone caves, but the published results of this will have to wait until the material is all sorted and named.

My first collecting place in the Wellington district was at Hokio Beach, Levin. Here is a long stretch of sand cut in places by rivers and backed by dunes. Though each length of beach is separately named according to its settlement—such as Otaki, Waikanae, etc., it would appear that the whole coastline presents similar features and ecology to some point south of Paraparaumu. Certainly at each part of the beach I went to the collecting was similar. There were a few *Maurea cunninghami, Alcithoe swainsoni* and *Xenophalium pyrum,* but not in the vast quantities which, I understand, are washed in at certain times. I collected plenty of conjoined pairs of certain bivalves: *Dosinia anus, Amphidesma subtriangulatum, Mytilus canaliculus, Mactra discors* and *Spisula aequilateralis,* all in nice fresh condition. I had never before found whole pairs of *Spisula,* so was delighted to get a good haul of them.

Next stop was Pahauatanui Harbour, at the head of a big tidal inlet. During the war I was for a while camped there, so found it most interesting to revisit the area. Though the camp has long since disappeared I had no trouble in remembering where my tent used to stand. In this locality one can step from the road right on to the sand flats, and it was only aminute or two before I found typical shells of such a place—*Amphibola crenata* in hundreds, together with many *Zeacumantus lutulentus, Zediloma subrostrata,* and the largest *Cominella glandiformis* I have yet seen. Under stones were good examples of *Notoacmea helmsi,* while at the roots of a small plant were many nice clean *Ophicardelus costellaris.*

From Pahauatanui I took the road via Judgeford and Haywards to Lower Hutt, where I stayed with friends. As it was quite early in the afternoon I went on to visit some friends at the Geological Survey which is now installed in a fine new building which is fast becoming a landmark in the Valley. I had the good fortune to be shown around the Survey, and needless to say spent a good deal of time viewing the fine collections of Recent and fossil mollusca which now run into many thousands of species. Of particular interest is the Suter collection, which is housed in steel cabinets, but is otherwise just as Mr Suter kept it, all in neat little cardboard trays and beautifully labelled in ink by Henry Suter himself. One point that I noticed in particular was that many well known species are represented by rather poor specimens. However, I suppose these were collected sixty or more years ago, and in those days there was not the convenient transport that we have today to enable us to get to good localities and so obtain good specimens. As far as the type specimens go, they, fortunately, are in consistently fair condition.

There are some good places in the Hutt Valley to obtain land mollusca. One morning I went with Dr. Dell to the top of a ridge overlooking Petone on one side and Wainui-o-mata on the other. The view from there is magnificent and very extensive, but as there was a southerly gale blowing the temperature was a bit too severe for one who is used to a more northerly latitude. But soon the excitement of collecting made one forget the cold. In a small patch of bush below the road we found *Flammulina compressivoluta, Otoconcha dimidiata, Charopa coma globosa,* a couple of *Ptychodons, Suteria ide,* and two or three specimens of the large slug *Athoracophorus.* Unluckily, it began to pour with rain so we had to rush home to put on dry clothes, and once indoors found it more agreeable to sit by the fire and talk "shop" rather than brave the elements once more.

Another day I went collecting at the Nae Nae cemetery, where *Wainuia urnula* is to be found living under gorse and bracken on the open hillsides. As there is not only gorse but blackberry in profusion as well, collecting is not easy. I collected a great many thorns and scratches as well as the half dozen snails I found. Still I considered it worth the trouble.

On the western side of the Valley near Silverstream is a bush reserve with masses of loose limestone boulders embedded in the earth. Here I found a good many live specimens of *Cavellia biconcave,* and one or two *Wainuia urnula.* Other species found were *Therasiella celinde, Omphalorissa purchasi, Phrixgnathus conella, Phenacohelix stokesi,* and one or two small species of the Laomidae which I have yet to determine. I hope to go back there some time for a really determined search of that locality. In a stream near by I found numbers of *Planorbis* and *Gunlachia* living in water weeds, as well as small specimens of an introduced water snail—*Physa fontinalis.*

Through the courtesy of Dr Dell I was able to have a good look through the collections at the Dominion Museum. They have some fine specimens from the old Bollons Collection, most of which were collected by Captain Bollons when he was master of the old steamers "Hinemoa" and "Tutanekai" which used to visit the lighthouses and off shore islands in the North, as well as the Sub-antarctic islands.

Other items of great interest are the shells from the Chatham Rise Expedition which include many outstanding novelties; and the Henry Suter Collection of Land and Fresh-water Mollusca. As with the marine collection at the Geological Survey, the collection is preserved as Mr Suter arranged it, thus adding to its historical value. Another collection of land mollusca in the Museum is that of the late Mr O'Connor, which is very useful as a reference collection as it is almost complete. During the years before the war the museum shells were rather neglected, but the collection is now in good order and growing rapidly.

One day Syd Hulme accompanied me to Island Bay and Lyall Bay to try out the marine collecting there. We did not strike a very low tide, and the water was far too cold for my liking, but even so I was quite well pleased with our catch. We found *Buccinulum sufflatum* and *B. strebeli mestayerae under* stones, the first I've collected. On the reefs were the most *Cellana denticulata* I've ever seen, and here to, *Benhamina obliquata* and *Siphonaria cookiana* were quite common. Washed up among the rocks were quite a number of *Argobuccinium tumidum,* a few *Alcithoe fusus,* and very large specimens of *Cookia sulcata, Lunella smaragda, Haliotis iris* and *australis* and one or two *Modelia granosa.*

Near the Lyall Bay Sewer was a good "washup" of *Aulacomya maorianus, Mytilus aoteana, Lepsithais lacunosa,* and some two or three varieties of *Buccinulum* that I have not yet varified. On the high tidal rocks are dozens of *Melarhaphe cincta* and some big *M. oliveri,* together with *Zediloma digna, Z. atrovirens* and *Notoacmea pileopsis.* A bit further down, and under loose stones are plenty of *Anisodiloma lugubris* and nicely marked specimens of *Amaurochiton glaucus.* In channels where sand is able to accumulate there are some patches of quite productive shell-sand which furnished *Thoristella chathamensis cookiana, Zemitrella chavo,* a species of *Paxula, Haurakia huttoni* and several other Rissoids, Chemnitzia spp., and so on. Seaweed washings *annulata, Zelaxitas cystophora, Liotella polypleura* and *Notolepton* at low water have provided me with *Dardinula olivacea, limbata* and *sanguineum.*

From Lyall Bay I went back into town by way of the coast road which is a very pleasant drive. At Seatoun I stopped and had a look along the sandy foreshore, and was rewarded with large specimens of *Mytilus canaliculus, Paphies largillierti,* and *Gari strangeri.* With them were a few valves of *Myadora striata,* one or two *Leptomya retiaria* and an empty *Penion mandarina.* The sand at Seatoun appears to have the same tendency to stain shells as Red Beach, near Orewa, does.

By the time I got round to Evans Bay the tide was well in, so that was the end of collecting for that day. The following morning I had to leave for home and made all haste to Taupo where I stayed overnight and then on home, as I found by then that numerous shells I supposed to be empty were in fact occupied so that I arrived home with the car smelling like a charnel house. Nevertheless I greatly enjoyed the whole trip and considered the collecting well worth while, so that at the first opportunity I shall take another trip down there.

Hunting Paryphanta On Mt. Duppa

By J. I. TOWNSEND, Nelson

Last March a small party left Nelson and went over the Whangamoa Saddle to begin the climb up Duppa at 8.45 a.m. We went in via hte usual forestry track which winds its way up the hills to the right of the Graham Stream. Once we got near the bush we struck off up a fairly steep ridge above the bulldozer track. Although this was still in the open along the forest edge, the gorse and fern was clear on the ridge and the going was easy. The view down over the main road increased in grandeur for every foot we climbed and soon we could see over the hills opposite the road to the sea. As we climbed higher Pepin Island and the bays each side came into view, also Mackay's Bluff. We could look down the full length of the Whangamoa Valley, and see some of the rugged coast line of the Sounds well to the north. Near the top of this spur we had to push our way through a narrow tongue of regrowth bush, and then the ridge became quite craggy with clumps of native *Danthonia* grass growing round about. This would be a little over 2000 ft., and here we entered the bush and went down a few feet across a saddle which joined our spur to the main Mt. Duppa Range. Almost as soon as we were in the bush we found the broken remains of *Paryphanta hochstetteri consobrina* and after a prolonged search we found one live specimen. We noticed that some of the broken shells we collected had a completely dark ventral surface, typical of *Paryphanta hochstetteri obscura.*

On the narrow connecting saddle were numerous pig wallows. The presence of the pigs was expected as their rooting had been only too evident further back, but we were surprised to find the mud holes filled with yater as they were right on the crest of the saddle and the country fell away very steeply each side. This, at the end of a long period without rain seemed strange. All the tree trunks in the vicinity were thickly encrusted with mud at convenient pig-height where the animals had rubbed themselves after their bath. The ferns and litter of leaves on the ground were covered with spots of dried mud that had dripped off the pigs' sides as they moved off. The whole tone of the bush had been changed to a light dappled grey.

Just at the foot of the climb up Duppa itself we stopped for lunch, and then examined another area which looked just ideal for snails. It was damp. There was plenty of leaf mould, also large logs and numerous Crown Ferns *(Blechnum discolor),* however not even a dead shell was found. As we ascended Duppa the ridge became more and more rocky. At first there were slanting slate like rocks protruding from the ground like drunken grave stones, and then a narrow belt of limestone, and finally huge rocks that we had to climb over or round. Some of these would be twenty feet high and after their tops were gained by a circuitous route a magnificent view through the bush of the surrounding countryside would be the reward. Tuis were plentiful and their raucous notes accompanied us to the top. Near the 3717 ft summit the gradient eased off to form a long crest of almost uniform height. It was here under a dry piece of bark that the only other live *consobrina* was taken. The bush persisted to within a few yards of the trig, where it was replaced by low growing cushion plants, tussock and rubble. The south side of the ridge fell away in an almost sheer drop to the head of the Tinline Valley to give a spectacular view of the rugged country around Mt. Fishtail and Mt. Richmond. More of the Sounds were visible than seen from further down. The Rai and Ronga Saddles, the Opouri Valley and Pelorous River were spread below us like a relief map. Nothing obstructed our 360 degree panorama.

We decided to return by descending one of the steep northern spurs and thus cut back through the bush to the old milling site almost 3000 ft below. Unfortunately our ridge soon ended in a sheer bluff which was avoided by descending into the gully on our left. This found us sliding down a semi-consolidated scree slope of about 45 degrees. Here many more dead snail shells were found. All had been damaged in some way, mostly by rats. The population of these vermin must be very high, as there are hundreds of safe hiding places for them amongst the loosely packed rocks. Again, a small proportion of the snails found here had a completely dark under side. A few instead of having the dark area sharply defined, had a rather irregular darker suffusion towards the umbilicus, almost suggesting an intermediate form between the two subspecies. However a study of many more specimens would be necessary before this could be confirmed. One rather curious example completely lacked the darker umbilicus and instead had a serious of bands similar to that of *Paryphanta hochstetteri hochstetteri.*

Thinking the going would be easier, we again tried a ridge but before long this likewise ended in a bluff. So into another gully we went, always bearing to our left. In desperation, after a third ridge ended in like manner we decided to follow a stream down. We continued at a fairly brisk pace as there was not much daylight left, and following this water-course to its junction with the Graham Stream would take us some distance out of our way. Anxiously we watched the gathering dusk. Realising that we had little more than a quarter of an hour's light left, we again changed our plans and followed another ridge in a final attempt to find the milling site from which the bulldozer track would lead us to the main road. Luckily, just before darkness fell we found the sawn-off stumps of the old mill workings, and from there we were soon on the track out.

Austrosuccinea Archeyi (Powell) —Further Records

By WILLIAM P. THOMSON

On 28th March, 1959, while on a day visit from Coromandel to Port Charles, the writer made a quick trip to Waikawau, a long, exposed ocean beach which faces east a few miles south of Port Charles on the Coromandel Peninsula, and, in the short time there, found three specimens (dead shells) of that most interesting sand-dune snail—*Austrosuccinea archeyi.*

They were located in their usual habitat, between the first and second dunes under cover of the sand grass, *Spinifex hirsutus,* and the introduced hare's tail, *Lagurus ovatus*. Also common on the dunes close at hand was the native shrub *Muehlenbeckia complexa.*

Of the specimens found, two were bleached (size 6.50 mm. and 7.00 mm.), while the other (7.50 mm.) still held its clear orange-coloured epidermis, which indicate that 'live' could possibly have been found if only there had been time for the search.

A few weeks later a communication from Mrs E. T. B. Worthy of Whangarei, dated 24th April, advised that a few 'dead' shells were found recently on the coast at Pataua which is about ten miles north of Bream Head; also that other specimens were found some time ago at Ngunguru which is approximately eight miles further north again.

Living specimens of this small snail have previously been recorded from the following areas (first records only being mentioned):—

1947—Tokerau Beach ,Doubtless Bay, Northland.

1947—Near Tauranga Kawau Point, North of Whananaki, Northland.

1947—Omanu Beach, Mount Maunganui, Bay of Plenty.

1949—Spirits Bay, Northland.

1949—Taipa Beach, Doubtless Bay, Northland.

1953—Papamoa Beach, Bay of Plenty.

1954—Whangamata, north of Waihi Beach, Bay of Plenty.

(For fuller listings see—"Records of the Auckland Institute and Museum" Vol. 4, No. 1, December 1950, and Conchology Section "Bulletins" No. 8, (1952), and No. 10 (1954).

The new localities here recorded narrow down the gap between the Northland and the Bay of Plenty areas. Waikawau is on the Coromandel Peninsula, some 50 miles north of Whangamata, while Pataua is approximately 20 miles south of Whananaki; thus there is forged further links in the chain between the Northland and the Bay of Plenty areas.

It therefore now seems reasonable to suggest that anyone able to search the sand dunes of the Kaitoki and Whangapoua beaches on the outer coast of the Great Barrier Island would most probably find some specimens, thus completing the chain.

Notes on Land Snails Collected From The Waitakere Ranges, Auckland

By ROGER REES, Auckland

Since I first took an interest in collecting land snails about four years ago, I have had opportunity of collecting in the Waitakere Ranges on several occasions. The Waitakere Ranges are situated about ten miles west of Auckland and are covered with dense native bush abounding in native snail fauna.

The following species I have collected, mainly from near the Scenic Drive.

Cytora cytora (Gray).
Cytora hedleyi (Suter).
Cytora pallida (Hutton).
Cytora torquilla (Suter).
Liarea egea egea (Gray).
Liarea hochstetteri carinella (Pfeiffer).
Otoconcha dimidiata (Pfeiffer).
Thalassohelix zelandiae (Gray).
Allodiscus dimorphus (Pfeiffer).
Allodiscus planulatus (Hutton).
Serpho kivi (Gray).
Therasiella celinde (Gray).
Therasiella tamora (Hutton).
Phenacohelix pilula (Reeve).
Phenacohelix ponsonbyi (Suter).
Suteria ide (Gray).
Flammulina perdita (Hutton).
Flammulina pilsbryi (Suter).
Ptychodon hunuaensis (Suter).
Ptychodon pseudoleiodon (Suter).
Ptychodon tau (Pfeiffer).
Ptychodon varicosa (Pfeiffer).
Charopa anguicula (Reeve).
Charopa chrysaugeia (Webster).
Charopa coma coma (Gray).
Charopa titirangiensis (Suter).
Fectola infecta (Reeve).
Fectola buccinella (Reeve).
Subfectola caputsinulae (Reeve).
Laoma marina (Hutton).
Laoma poecilosticta poecilosticta (Pfeiffer).

Phixgnathus elaiodes (Webster).
Phixgnathus erigone (Gray).
Phrixgnathus mariae (Gray).
Phrixgnathus moellendorffi (Suter).
Phrixgnathus trailli (Suter).
Delos coresia (Gray).

NOTES:

Cytora cytora (Gray). A small squat shell with a bristly epidermis, uncommon in this area. Collected in dead Nikau fronds.

Cytora hedleyi (Suter). Rather like *cytora* but with prominent riblets. Quite common in dead Nikau fronds.

Liarea hochstetteri carinella (Pfeiffer). Very common in Nikau fronds and bush mould.

Otoconcha dimidiata (Pfeiffer). Uncommon. Likes damp Nikau fronds and Punga stumps.

Thalassohelix zealandiae (Gray). Uncommon. Collected in bush mould.

Allodiscus planulatus (Hutton). Uncommon in damp patches, a small pale shell.

Phenacohelix pilulo (Reeve). A pale shell with a prominent pattern in this locality. Uncommon in dead nikau fronds.

Ptychodon varicosa (Pfeiffer). Much the same as *Ptychodon tau,* but with a single tooth at the aperture. Quite rare.

Charopa coma coma (Gray). A common shell with a wide umbilicus and a brown and white pattern. Common under rotting stumps and leaf mould. Grows up to 5 mm.

Phrixgnathus elaiodes (Webster). A tiny semi-transparent shell, only 1.5 mm. in diameter. Uncommon in Nikau fronds.

Phrixgnathus mariae (Gray). The largest of the genus. Diameter 7 mm. Has a keeled body whorl and a light zigzag pattern covering the shell. Quite common in places. This is the only locality in which I have collected this species.

Delos coresia (Gray). A pretty brown glossy shell, sometimes striped with yellow. Common in leaf mould and under rotten logs. Some specimens grow to 4 mm. in diameter.

Some Land Molluscs From The Northern End Of The South Island

By GRAEME ANNABELL, Palmerston North

In January, 1955, my father took me to spend the holidays on a camping tour of the northern end of the South Island. We spent most of our time in the Collingwood district and in the Sounds. From these two places we made frequent trips to other spots of interest. For nearly all of the trips the weather was fine, but on one trip we were marooned after a fall of nearly three inches of rain. This was at Kahurangi Point Lighthouse which is twelve miles along the beach from the nearest road and over several rivers. My trips for shells were nearly all made in the company of my grandfather, Mr H. S. Prouse.

The following are some of the shells that were collected.

Paryphanta gilliesi aurea Powell.
Paryphanta gilliesi brunnea Powell.
Paryphant gilliesi fallax Powell.
Paryphant gilliesi kahurangica Powell.
Paryphanta hochstetteri bicolor Powell.
Paryphanta hochstetteri consobrina Powell.
Paryphanta hochstetteri obscura Beutler.
Rhytida meesoni meesoni Suter.
Thalassohelix prousei Powell.

NOTES:

P. g. aurea Powell. 600 feet. Moderate climb from Mangarakau. Preferred cover of dead leaves, but were rare because of cattle. Alive and dead.

P. g. brunnea Powell. Patarau, 50 feet. Scarce because of rodents, fowls and cattle. Found mainly under the leaves of ground *Astelia*. Some juveniles also found under flax. Alive and dead.

P. g. fallax Powell. On track towards ironworks quarry, Onekaka, 700-900 feet. Mainly under one foot high pig-fern, but also under rotting timber. This species seems to be only growing to a sub-normal size and is very thin shelled. Alive and dead.

P. g. kahurangica Powell. Kahurangi Point, 60 feet. Preferred a general cover of leaves, but are rather scarce. Alive and dead.

P. h. bicolor Powell. Sea level upwards on Blumine Island. This species is plentiful due to the absence of rodents, deer and stock, and is therefore found under anything. Unfortunately the majority of specimens were not adult. Alive and dead.

P. h. consobrina Powell. Goulters Bay, 100 feet. These were difficult to find as they were under six foot bracken. Specimens were all damaged. Alive only.

P. h. obscura Beutler. Mt. Shewell, 2,000-2,700 feet. Not many were found. Many specimens had a hole in the body whorl. Little cover due to deer. Three alive and several dead.

Rhytida meesoni meesoni Suter. Mount Shewell, 1,000-2,700 feet. Found dead anywhere, but mostly under isolated patches of pig-fern, bracken and in the aperture of dead *P. h. obscura*. Also two live specimens.

Recent Molluscan Literature

Since July, 1957, there have appeared the following papers of interest to students of New Zealand Molluscan fauna.

RALPH, Paricia M. "A Guide to the New Zealand Heteropod Molluscs" Tuatara, Vol. VI No. 3, December 1957.

The Heteropods are free swimming pelagic gastropods. They are unfamiliar to most amateur conchologists. This article tells us something of the characteristics of the group and its three Families, two of which are represented in New Zealand waters. Illustrations are given of two New Zealand species. A key is provided for help in recognising the five species known from our coastal waters. These species are—

CARINARIIDAE:
Carinaria galea Benson.
Carinaria lamarcki Peron and Lesueur.

PTEROTRACHEIDAE
Pterotrachea scutata Gegenbaur.
Pterotrachea coronata Forskal.
Firoloida desmaresti Lesueur.

POWELL, A. W. B. "New Zealand Molluscan Systematics with Descriptions of New Species, Part 3." Rec. Auck. Inst. Mus. Vol. 5, No. 1 and 2, 14th May, 1958.

Two new species are described and three other species are discussed in this paper. The two new species are *Aeneator galatheae,* from deep water in Milford Sound, and *Sabia wyattae,* from beach drift at Tutukaka, Northland. This latter species was discovered by Mrs J. Wyatt attached to a dead shell of *Penion adusta,* and is interesting in that it is the only authentic record of a Hipponicid in the Recent New Zealand fauna.

The other species discussed are (a) the common southern mussel previously known as *Mytilus planulatus* Lamarck, which is shown to be distinct from the Australian *planulatus* and is here named *Mytilus aoteanus.* (b) *Aulocomya maoriana* (Iredale). This other well known southern mussel is shown to include regional subspecies, but which cannot yet be properly differentiated and named. (c) The shell featuring in our lists as *Mesoclanculus takapunaensis* (Webster). The holotype of this species is considered by the writer to be in all probability a specimen of the Australian *Mesoclanculus plebejus*. Since no specimens apart from the original one have been found in New Zealand, Dr. Powell recommends that this species be relegated to a suspense list.

FLEMING, C. A. "A New Species of *Sigapatella* (Gastropoda) from Cape Maria van Diemen, Northland, New Zealand." Rec. Dom. Mus. Vol. 3, Part 2, July, 1958.

The new species described in this paper is named *Sigapatella superstes.* It is distinguished from the common *S. novaezelandiae* Lesson, by its granular sculpture, and from *S. terranovae* Piele, by its shape, sculpture and prominent umbilicus.

The relationship of the new species with other species both recent and fossil is discussed. There is a discussion also concerning the occurence of species now restricted to the far northern tip of New Zealand but with fossil ancestors in other parts of the country.

McMICHAEL, Donald F. "The Nature and Origin of the New Zealand Freshwater Mussel Fauna." Trans. Roy. Soc. N.Z. Vol. 85, Part 3, August, 1958.

The New Zealand Recent freshwater mussels are reviewed briefly and the relationship with those of Australia and South America are discussed. The suggestion is made that the New Zealand mussels have been derived from Australian stocks brought across the Tasman Sea by birds.

McMICHAEL, D. F. and HISCOCK, I. D. "A Monograph of the Freshwater Mussels (Mollusca Pelecypoda) of the Australian Region." Australian Journal of Marine and Freshwater Research. Vol. 9, Part 3, pp. 378-508, 1958.

This monograph reviews the classification of all Australian and New Zealand Freshwater mussels. They are all referred to the family Mutelidae. As amended by these authors the classification of the New Zealand species is as follows:

Family: Mutelidae
Sub-family: Hyridellinae Iredale, 1934.

1. *Hyridella (Hyridella) aucklandica* (Gray, 1843).

=*Unio lutulentus* Gould, 1851 (in part). This is the elongate-oval non winged shell =*lutulentus* of Suter's Manual.

2. *Hyridella (Echyridella) menzies* (Gray, 1843).

Sub-family: Cucumerunionidae Iredale, 1934.

3. *Cucumerunio websteri websteri* (Stimpson, 1902).
4. *Cucumerunio websteri delli* n. subsp.

This is the shell Dell, 1953 identified as *aucklandica* i.e. Pl. 17, figs. 2, 8 and Pl. 19, figs 4, 8. non *aucklandica* Gray which is a *Hydridella.*

CLARK, W. C. "The New Zealand Species of *Melagraphia* Gray and *Zediloma* Finlay." Trans. Ray. Soc. N.Z. Vol. 85, Part 4, November, 1958.

This paper reviews the genera mentioned in the title. The shell, operculum and external morphology of the New Zealand species are redescribed. Suggested changes in the classification of the species of *Zediloma* are shown in the following list based on the proposal of this paper.

Zediloma (Zediloma) digna Finlay.
Zediloma (Zediloma) arida Finlay.
Zediloma (Fractarmilla) atrovirens (Phillipi).
  (=*moria* Troschel).
Zediloma (Fractarmilla) subrostrata subrostrata (Gray).
  (=*corrosa* A. Adams).
Zelidoma (Fractarmilla) subrostrata zebrina Powell.

The reasons for including *morio* and *corrosa* under *atrovirens* and *subrostrata* respectively, are given. A key to the species is provided. The paper is illustrated.

FLEMING, C. A. "Notes on New Zealand Recent and Tertiary Mussels (Mytilidae)" Trans. Roy. Soc. N.Z. Vol. 87, Pt. 1 and 2, July, 1959.

This interesting review of the New Zealand mussels proposes several changes in the classification of the species. The changes as they affect Recent mussels can be shown in a revised checklist as follows.

MYTILIDAE
Mytilus Linnaeus.
  edulis aoteanus Powell. (=*M. of planulatus* Lamarck =*M. aoteanus* Powell).
Perna Retzius.
  canaliculus (Gmelin ex Martyn).
Aulacomya Moerch.
  maoriana (Iredale).

Septifer Recluz.
cf. bilocularis (Linnaeus).
Modiolus Lamarck.
areolatus (Gould).
fluviatilis (Hutton).
neozelanicus (Iredale).
Zelithophaga Finlay.
truncata (Gray).
Ryenella Fleming n. gen.
impacta (Hermann).
Gregariella Monterosato.
barbata (Reeve).
Dacrydium (Quendreda) Iredale.
pelseneeri Hedley.
Crenella Brown.
radians (Suter).

—H. E. W.

List of Members, 1959-60

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CONCHOLOGY SECTION
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JULY, 1961.

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Dredgings from Manukau Harbour, Auckland

By S. G. HULME, Geological Survey, Lower Hutt.

INTRODUCTION

Early in January this year, a one day dredging trip was carried out in the Marine Department's fisheries patrol launch, stationed at Weymouth, Manukau Harbour.

Twenty-two samples were collected in all, using a conical dredge. Material was taken from mid-harbour stations as well as from channels and mudbanks. Depths varied from a few fathoms to sixteen fathoms.

Sampling commenced in Weymouth Channel, progressing out to its junction with Waiuku Channel. From there across harbour to Pu Ponga Point, then down harbour on the north coast almost to Whatipu (North Head). Further samples were taken off Wattle Bay, and upper reaches of Waiuku Channel, see fig. 1.

ACKNOWLEDGEMENTS

The writer wishes to thank Mr. E. W. Gilliver, District Inspector of Fisheries, Auckland, for making this trip possible. With assistance from Mr. Gilliver, and Mr. Norman Jones, skipper of the launch, who helped to haul and plot each dredging, a successful programme was completed.

TYPE OF MATERIAL OBTAINED

The enthusiastic conchologist, usually wonders what rare species lie below the lowest tide mark. This thought had passed through the writer's mind more than once, after collecting trips along Manukau shores. Unfortunately the molluscan faunas were rather disappointing, but some interesting occurrences of Foraminifera have been noted.

Listed below is a very brief description of each sample, giving the most noticeable molluscan faunal dominants, and other details relevant to individual samples.

From this list it will be seen that few molluscs can survive in much of the sandy bottom, deepwater area, where tidal currents are very strong. Even the microfauna (small molluscs and Foraminifera, etc.) is sparse, often containing mostly dead, worn material, from other habitats.

No detailed faunal lists are presented in this article, but rather

MANUKAU HARBOUR DREDGINGS

See Marine Chart 2726 — Coll. S. G. Hulme 8/1/59

Station No.	Depth in fathoms	Lithology	Faunal dominants N.B. These dominants are approximate only, being the most obvious species from a brief examination.
1. S. edge of channel	2½	Rounded sst. pebbles, coarse sand, with black mud.	Nucula hartvigiana, Maoricolpus r. manukauensis, common.
2. S side of channel	2	Fine sand with little mud.	No obvious macrofauna
3. S. mid-channel	4	Sst. pebbles. Very shelly coarse to fine sand and mud.	Nucula hartvigiana, Maoricolpus r. manukauensis, very common
4. S. mid-channel	4	Black mud, fine sand, broken shell	Paphirus largillierti, Nucula hartvigiana, Maoricolpus r. manukauensis
5. S. mid-channel	6	Sandy with little mud.	Cominella adspersa melo. Paphirus largillierti (few other species).
6. S. mid-channel	10-11	Find sand and shells.	Mostly dead material.
7. S. mid-channel	10	Fine sand and shell.	Paphirus largillierti, Nucula hartvigiana, Maoricolpus r. manukauensis.
8. S. mid-channel	12-13	Fine clean sand	No obvious macrofauna
9. S.	15-16	Fine clean sand, broken shell.	Broken worn shell.
10. S. sand bank	2	Fine clean sand.	No obvious macrofauna
11. S.	5	Clean sand slightly coarser than 10S.	No obvious macrofauna
12. S.	12-13	Find clean sand.	No obvious macrofauna.
13. S.	11-12	Clean sand (slightly coarser than 12.S.)	No obvious macrofauna
14. S.	9-10	Clean fine sand.	No obvious macrofauna
15. S.	7	Clean fine sand.	No obvious macrofauna
16. S.	7	Sand with little mud.	Paphirus largillierti etc.
17. S.	15-16	Fine sand, very small amount of mud.	No obvious macrofauna
18. S.	15-16	Sand with very small amount of mud.	No obvious macrofauna
19. S. mid-channel	4	Coarse sand. mud and pebbles.	Nucula hartvigiana, very common, Maoricolpus r. manukauensis etc.
20. S. mid-channel	6	Coarse sand, little mud, pebbles etc.	Much dead shell. Maoricolpus r. manukauensis etc.
21. S. mid-channel	4	Coarse sand, little mud, pebbles.	Much dead shell. Paphirus largillierti Maoricolpus r. manukauensis.
22. S. to side of channel on sand-bank.	3	Fine sand, slushy, very black mud.	No obvious macrofauna

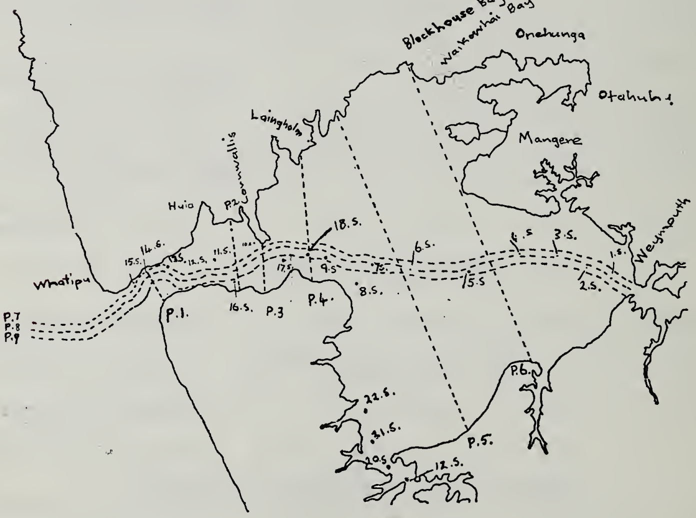
a general account of bottom conditions, as indicated in the above list. With the aid of profiles, a general picture of sea-bed topography in the harbour has been given.

Accompanying the following chart, upon which each sample station is plotted, are nine harbour profiles (figs. 2 and 3). Tracks of these profiles are shown on the chart as dotted lines.

MANUKAU HARBOUR

Chart showing location of sample stations and profiles

(Fig. 1)

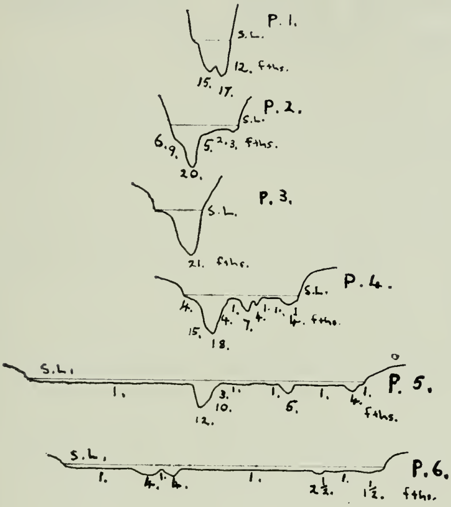

Blockhouse Bay
Waikowhai Bay
Onehunga
Otahuhu
Laingholm
Cornwallis
Mangere
Huia
P.2
18.S.
Weymouth
14.S.
15.S.
13.S.
12.S.
11.S.
10.S.
17.S.
9.S
7.S.
6.S.
4.S
3.S.
1.S.
5.S
2.S.
8.S.
Whatipu
P.1.
16.S.
P.3
P.4.
P.7
P.8
P.9
P.6.
22.S.
21.S.
20.S
12.S.
P.5.

Scale: 1 inch = Approx. 8 miles.
Sample Stations are denoted with the affix S. e.g. (8S.)
Profile tracks are prefixed with P. e.g. (P7.)

Considerable irregularity of bottom contours, is indicated by the profiles, most noticeably in the deeper narrows towards the harbour entrance. The steeply sloping high spots are probably hard rocky outcrops of volcanic breccia, as seen at Pu Ponga Point, with pockets of clean sand in between. Swift tidal currents carrying much sand backwards and forwards with each run of the tide are encountered within the comparatively narrow harbour entrance. Profiles five and six are conspicuously even, being broken only by the main tidal drainage channels of the upper harbour.

MANUKAU HARBOUR PROFILES

(Fig. 2)

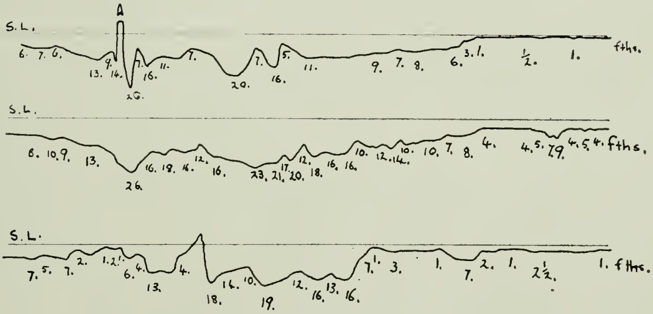

P. 1.
S.L.
12. fths.
15. 17.
P. 2.
S.L.
6. 9. 5. 2. 3. fths.
20.
P. 3.
S.L.
21. fths.
P. 4.
S.L.
4. 15. 18. 4. 7. 4. 1. 1. 1. 1. 4. fths.
S.L.
P. 5.
1. 3. 1. 10. 12. 1. 6. 1. 4. 1. fths.
S.L.
P. 6.
1. 4. 1. 4. 1. 2½. 1. 1½. fths.

Horizontal Scale:
1 inch = approx. 5 Nautical Miles.

Vertical Scale:
Small figures under contours indicate depth in fathoms.

MANUKAU HARBOUR PROFILES

(Fig. 3)


A
S.L.
fths.
S.L.
fths.
S.L.
fths.

Horizontal Scale: 1 inch = Approx. 5 nautical miles.
Vertical Scale: Small figures under contours indicate depths in fathoms

REFERENCES

Powell, A. W. B., 1957, Shells of N.Z. Whitcombe & Tombs Ltd., Auckland.

—————— 1937, Animal Communities of the Sea-bottom in Auckland and Manukau Harbours. *Trans. roy. Soc. N.Z. vol. 66, pp. 354-401.*

Admiralty Chart No. 2726, Manukau Harbour, N.Z., 1958.

Notes on Land Mollusca from Waitomo.

By PHIL WARREN, Leigh.

In our last Bulletin No. 15, I mentioned collecting land snails near the Waitomo Caves. These have now been sorted and the species determined, some of which are of special interest to me as I have not previously taken them elsewhere.

At the time I collected there, in mid-March, the weather had been fairly dry, so it is quite possible that the snails would be more abundant during wetter conditions, as some of the species although alive were decidedly scarce, while others were only taken as empty, and quite often bleached, shells.

The actual time spent collecting would only amount to a couple of hours and I would suggest that a longer period spent in this area would be well worth while as I am certain that some species would be found to be more abundant than they were during the short time I searched, and others that I did not see at all would probably turn up as well, for example, I only found one species of *Ptychodon.*

The main area collected in was the hillside above the entrance to the glow worm cave. Here, there are huge limestone rocks and on top of these are small plants, beneath which are deposits of earth and dead leaves. I found this to be a good place to seek the smaller varieties. The larger shells were on the hillside under the usual load of leafmould, etc. There is also a patch of bush directly opposite the hotel, and which is quite easily reached by crossing the stream which runs more or less parallel with the road in this part. I only spent about twenty minutes there as time was fleeting, but in that time I took half a dozen live specimens of *Schizoglossa n. novoseelandica* in little pockets of wet leaves. The animals were curled up in their habitual resting position — I should think that they are decidedly nocturnal in their foraging habits. After finding the first couple of *Schizoglossas* I concentrated on these and did not look for any small snails in this particular piece of bush, but I should say that there are sure to be some there awaiting discovery.

At the Cave area the largest snail found was *Rhytida greenwoodi,* living under dead leaves of some kind of Astelia-like plant. The live shells were not very plentiful but quite a few old empty ones were scattered about. All the ones I saw are of an all-over brown colour, without the darker patch at the base of the shell. There did not seem to be many tree ferns where I was seeking the shells but no doubt they would be there too, supposing the dead leaves were available for them—as it was they just took whatever cover was available at this particular spot.

By far the most common snail there seems to be *Liarea hochstetteri carinella.* This one occurs as far south as the Awakino Gorge, so that the Waitomo locality helps to track the dispersal plan. Most of the specimens collected agree quite well with those of other localities, except that they are inclined to be slightly smaller than those from about Auckland, and a few live ones are albinos. Most of the specimens taken were live shells, and they did not seem to mind where they lived, some being in quite arid places.

As *Ptychodon pseudoleioda* seems to be in most places I've collected at, I was not at all surprised to find it there too, the specimens agreeing in all respects with those from other localities. I think it most probable that other species of *Ptychodons* were overlooked as they are usually not readily found unless one takes home leafmould or earth samples and goes through them with a strong lens.

The Flammulinidae were most strongly represented by *Serpho kivi,* quite common as an empty shell on the ground though only two or three were actually collected living on trees. Some specimens are of large size for the species and would appear to have been nicely striped with brown marks when alive. So often the good sized ones get pale with age in most places.

Thalassohelix ziczac was there, about eight specimens being taken from among pockets of damp leaves round tree roots. In the same places were several *Suteria ide* of average size and colouring. *Therasiella celinde* was found under dead leaves but only about half a dozen specimens; no others of this group were seen. *Phenacohelix* was, of course, well represented by *P. ponsonbyi,* numerous live and dead ones being gathered. Only one *Flammulina* was found, this being *F. perdita,* a couple of live ones and a few old broken ones. *Allodiscus* was also limited to one species, the reasonably widespread *A. granum.* My three specimens were all alive, and identical with those from elsewhere.

I was rather pleased to find a few *Laoma lemonias* there, as I had not collected it before. They were under dead leaves, and quite unmistakeably this species, even to the naked eye. It seemed to be rather more common than *Laoma marina* which was living under similar conditions. The most abundant *Laoma,* however, was the ubiquitous *L. poecilosticta* and its subspecies *conicula,* both of which seem to turn up on all my snail hunts.

Other *Laomids* taken were *Phrixgnathus erigone* living on Coprosma leaves; *P. conella* and *P. mariae* fairly common under dead leaves on the ground, and a few specimens of *P. ariel.* These latter were all empty shells and I think they had probably fallen from off the trees. There were one or two bleached specimens of a *Paralaoma,* probably *allochroida,* but they were very brittle and eventually disintegrated while in transit, so that positive determination is impossible until the next trip down there.

Tornatellinops novoseelandica was taken as a live shell on tree trunks and a couple of empties were found in the leafmould, but they are very hard to see on the ground. I think more would be collected during wet weather which usually brings them out.

Charopa coma which seems to be common in most places was restricted to one solitary example and a very old dead one at that. However, some other members of the family more than made up for its absence. *Fectola* turned up in the guise of some nice *F. tapirina,* plus its little cousin, *Subfectola caputspinulae* both of which seemed to favour rather earthy places. Also in the earth were a couple of *Charopa chrysaugeia* but I think they may have been dead ones though they look quite fresh. The only *Mocella* was *M. cogitata,* another fairly widespread species from all accounts though I personally have seldom found it. There were also two species of *Geminoropa* which I had not collected before. These are *G. microrhina* represented by a pair of rather shabby specimens, and one bleached example of *G. moussoni,* which fortunately is still in quite good condition.

Finally, a couple of introduced European species. These are *Cochlicopa lubrica,* which looks rather like a very tiny *Placostylus,* and the widespread flat brown snail *Oxychilus cellarius.* Both of these seemed to be quite common in the leaf mould, the latter species being the more common of the two; the majority of the specimens I found were alive. Since my trip to Waitomo, Mr. Ian Jackson has also been collecting there during Easter, 1960, and has taken numerous living examples of both these snails, particularly the *Cochlicopa,* so that they seem to be well established in that area.

Stewart Island Notes.

By ELSIE SMITH, Half Moon Bay

Neogaimardia minutissima (Iredale). This was collected by Dr. Powell in shell-sand at Mason Bay in 1934. Since then I have procured it in small numbers from Mason Heads, Codfish Island, Ocean Beach and Sawyer's Bay. Recently (5/6/60) Mrs. E. Willa was collecting fertile sea-weeds at Ringaringa Beach during the low spring tides. Throughout the weed she found "masses" of *N. minutissima,* and in particular noted large numbers as being actually attached to *Lenormandia chauvinii.* In June, 1952, I found similar numbers among low-tide weed on a rocky beach nearer the lighthouse; these however, were *Gaimardia forsteriana* with a few *N. minutissima* intermingled.

Panopea smithae Powell. Foveaux Strait oyster beds; trawled at "Lucky" fishing grounds off the North coast. (J. Aitken.)

Panopea zelandica (Q. & G.). Trawled on muddy bottom in the North Arm, Paterson Inlet (R. H. Traill); single valves washed ashore on various beaches.

Notacmea (Conacmea) daedala (Suter, 1908). Some specimens collected from Lee Bay and the Gutter at Mason Bay, where the rocks are exposed to heavy seas, are much larger and heavier than is usual. In general outline they could easily be mistaken for *helmsi.* They are grey-green in colour, and have an internal band of green callus like that of *A. fragilis.*

Xenophalium harrisonae Powell. These appear to be found only at the type locality, washed up on Mason Bay. They vary considerably in size and thickness of shell, strength of nodules and development of outer-lip denticles, and also in the number and strength of the little ridges across the parietal wall and columella. A very thin specimen lacks altogether both nodules and denticles. A shell trawled off Port Adventure in 40 fathoms was placed in this species for me by Dr. Powell some years ago. It is a thinner, narrower shell with taller spire, no nodules and obsolete basal spirals. A further 4 shells from 4 miles South of Bench Island in 25 fathoms, and one from a cray-fish pot off Codfish Island are all of this kind, although the outer-lip denticles in some are absent. They probably represent a deeper-water population of *X. harrisomae.*

Poireria zelandica (Q. & G.). Suter's "Manual" gives this as collected at "Stewart Island'. One shell was picked up at Bungaree by Mrs. P. Hamilton in December, 1959.

NEW RECORDS FOR STEWART ISLAND

Chlamys (*Mimachlamys*) *gemmulata* (Reeve). In cod's stomach, Foveaux Strait (A. S. Macdonald): in cod's stomach at "Lucky" off the North Coast. Three specimens altogether.

Pisidium aucklandicum (Suter). Mill Creek at the Black Bridge, 28/5/60.

Chlamys (*Mimachlamys*) *taiaroa* Powell. One half-grown specimen in cod's stomach.

Charonia rubicunda (Perry). Foveaux Strait oyster beds (O. Allan); off Bench Island on a crayfish pot.

Aplysia brunnea (Hutton). A preserved specimen from Mrs. Harrison's collection probably belongs to this species. Later records are from the head of Paterson Inlet, 4 fathoms; off Halfmoon Bay, 20 fathoms; Leask's Bay, on rocks (E. Willa). These last may have been brought up by the recent tidal wave.

Two New Records of Paryphanta From the Nelson Province.

By J. I. TOWNSEND, Nelson.

Paryphanta (*Powelliphanta*) *hochstetteri* (Subrecent).

Some damaged *Paryphanta* snails were found amongst rubble at the bottom of a thirty-foot sink-hole in the Upper Takaka District on 16/7/60. Owing to the bleached condition of the specimens it was not possible to determine the sub-species, but as the locality was directly across the Takaka Valley from the Pikikiruna Range where typical *hochstetteri* occurs they are probably representatives of that form. Judging from other remains associated with the snails it does not seem likely that they are of very recent origin. Amongst the mud where they were found were other small landsnails which are apparently extinct today. Bird bones were also present. On 20/8/60 further *Paryphanta* remains were collected from the eastern side of the Takaka Valley at the foot of the Pikikiruna Range. They were in a sink-hole associated with other snails and moa bones. Additional specimens were collected in 17/9/60 by D. S. Allison from caves near Motupipi. The above discoveries were made during field trips organised by the newly formed Nelson Speleological Group.

Dell (1955) reports the finding of a subfossil *Paryphanta* of the *gilliesi* series in the cave at Punipaua Creek near the Paturau River on the West Coast. In the same paper references are made to various subfossil *Paryphanta* from the North Island.

Paryphanta (*Powelliphanta*) *rossiana patrickensis* Powell, 1949.

During a recent trip (24/2/60) to Mt. Owen in the Western Ranges, two specimens of a *Paryphanta* were taken by F. E. Cobeldick and the writer. The snails were found amongst clumps of tussock at about 4,500 feet on the Lookout Range east of Mt. Owen. The area was somewhat swampy, the general topography suggesting an old glaciated valley. One specimen was alive and its radula has been preserved. They are mature shells of relatively small size having the shape and colouration of *P. rossiana patrickensis.* On 7/5/60, M. R. Johnston obtained a further specimen, this time from the southern slope of Mt. Owen at over 4,000 feet. This one is typical in having a somewhat higher spire. However, there seems little doubt as to the identity of these snails. They have been compared with specimens of the various subspecies comprising the *rossiana* series.

Measurements:—

Maximum diameter	Minimum diameter	Total height	Umbilicus diameter	Depth of body whorl opposite to aperture	
32.0 mm.	29.0 mm.	21 mm.	5 mm.	15.0 mm.	Lookout Range
39.0 mm.	29.0 mm.	21 mm.	5 mm.	15.0 mm.	Lookout Range
36.5 mm.	29.0 mm.	25 mm.	5 mm.	14.5 mm.	Mt. Owen
35.0 mm.	29.0 mm.	21 mm.		15.5 mm.	holotype

The figures given above for the holotype are those published by Powell (1949). It can be seen that the measurements of the recently found specimens correspond with those given for the holotype of *patrickensis.*

This record considerably extends the range of the subspecies as previously it was known only from near the West Coast around Denniston and Millerton.

REFERENCES.

Dell, R. K., 1955: Some New Zealand Subfossil Land Mollusca *Rec. Dom. Mus., Wellington* 2, 3, pp. 135-144.

Powell, A. W. B., 1949: The Paryphantidae of New Zealand No. VI. *Rec. Auckland* (*N.Z.*) *Inst.*, 3, 6, pp. 347-367.

Spirals in Shell

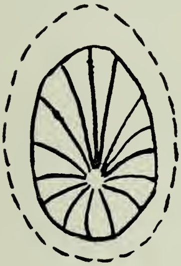
By P. B. HUTTON, Auckland.

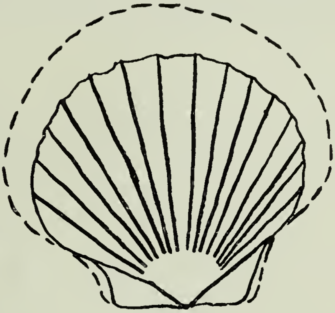
I have found this subject a fascinating link between my interests in conchology and mathematics.

Most molluscs (unless they are in an enclosed space) add to their shells in such a way as to keep the same overall shape while increasing in size.

Shells May Grow by:—

(a) Increase round the whole margin. (Example: a limpet.)
(b) Increase around most of the margin, except for one place (which is the hinge in bivalves).
(Example: the flat valve of a Pecten or scallop.)
(c) Adding at the aperture. (Example: a snail.)


(a)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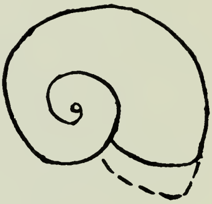
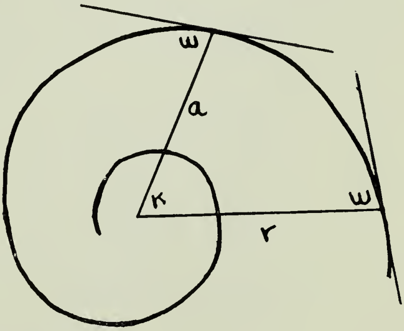

(c)

The last case is the most interesting mathematically, because, to keep the same shape, the shell must grow in an *equiangular spiral*. This is so named because on any point on the curve the angle is constant between the radius and the tangent to the curve at that point.



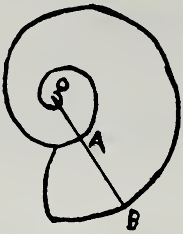
$r = ae^{k \cot w}$ The equation of an equiangular spiral is r=ae k cot w

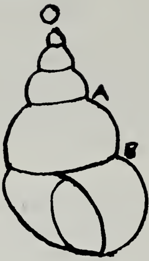
a
r
k
w

Where a is the initial radius,
r is the final radius,
k is the angle swept througn,
w is the constant angle.

Univalves

Let us consider a univalve with a spiral shell.





It can be proved that if the univalve has a perfect equiangular spiral, then the ratio of OB to OA will always be constant.

On a Maurea pellucida I drew pencil lines from the apex to the body whorl and measured the lengths of many pairs of consecutive radii. The results for “$\frac{\text{OB}}{\text{OA}}$” were as follows:—

1.58, 1.51, 1.53, 1.49, 1.51, 1.54, 1.52, 1.51, 1.55, 1.48,
1.56, 1.43, 1.50, 1.50, 1.52, 1.53, 1.56, 1.49, 1.54, 1.54, 1.54.

These figures show that the spiral of the Maurea pellucida was a close approximation of a true equiangular spiral. There were probably errors due to drawing the pencil lines from the apex and reading the callipers. The “constant” angle (from now on referred to as the “spiral angle”) can be calculated to be between 86°4’ and 86°26’. This involves the very small variation of 22’.

The following is a table of the approximate spiral angles in other univalves, measured from single specimens. (Please do not expect them to be accurate for any one specimen.)

	Spiral Angle	Variation due to measurement
Maurea punctulata	84° 42’	0° 5’
Zethalia zelandica	84° 00’	1° 3’
Tonna haurakiensis	82° 45’	1° 0’
Neothais scalaris	82° 55’	0° 10’
Tanea zelandica	81° 00’	1° 40’
Lunella smaragda	85° 00’	1° 0’
Cookia sulcata	84° 20’	1° 40’
Cominella adspersa	85° 00’	0° 6’
Buccinulum multilineum	85° 20’	0° 50’

To provide an example of the variation of the spiral angle among individuals of a species, I collected thirty-six Amphibola crenata (mudflat snails) and made three pairs of measurements on each (216 readings of the callipers) using the same method as with Maurea pellucida.

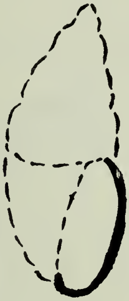
I found that nearly all the ratios were between 1.80 and 2.18, which gave a spiral angle between 84° 39’ and 82° 56’, and a variation of 1.6°.

The range of variation between the three readings for individual shells was in some cases as great as the total range for most of the shells. (Two atypical specimens had a ratio as high as 2.46: one was worn and with protoconch absent; the other had a much narrower apical angle than usual.)

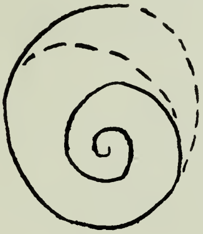
In other words, no significant range of difference of spiral angle among individuals in the species was demonstrated. Probably much of the range of figures arrived at was due to errors in measurement. The likelihood of error was much greater in measuring Amphibola crenata, because the pencil line had to be drawn over the curved surfaces of the whorls, instead of the almost straight side of a Maurea pellucida.

SPIRALS IN OPERCULA.

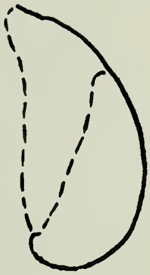
Opercula often take on the shape of the aperture, because they must fit closely to the shell. Sometimes the aperture has one spiral side. (See figure 1.)



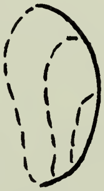
(Fig. 1)



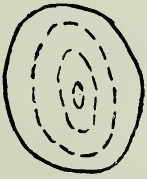
(Fig. 2)
(e.g. Lunnella smaragda)



(Fig. 3)
(e.g. Nerita melanotragus)



(Fig. 4)
(e.g. Neothais scalaris)



(Fig. 5)

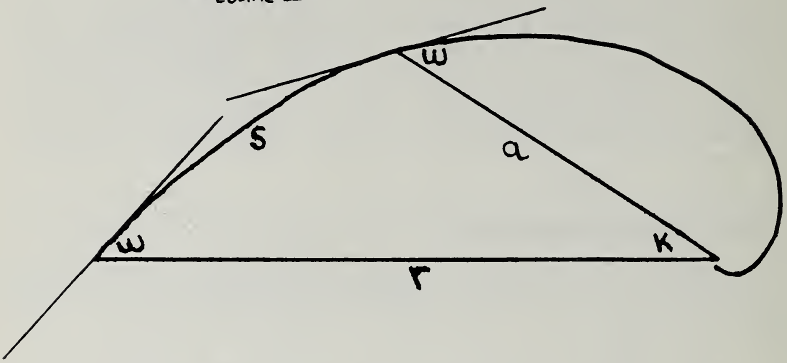
If the operculum is rotated as the shell grows, it takes the form typified by figure 2 and figure 3. Otherwise, the operculum will grow as in figure 4.

There is also a possibility of it growing in concentric circles (see figure 5), but I have not found any examples. At first I thought Zediloma atrovirens had an operculum of this type, but on microscopic inspection I found it was really a very close spiral of angle only 2.5° less than a right angle. (A 90° "spiral" is a circle.)

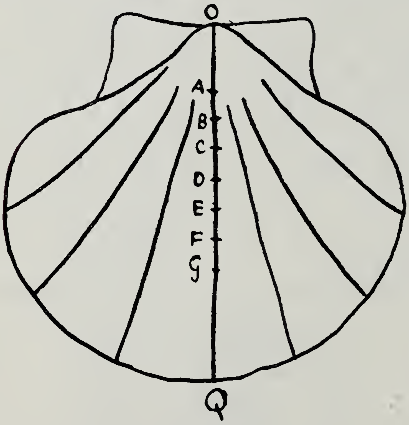
SPIRALS IN BIVALVES.

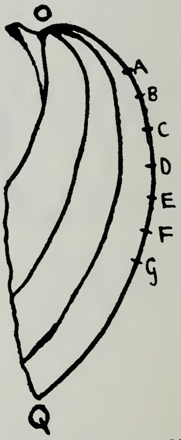
It is another property of the equiangular spiral that if the arc length (the distance around the curve) is s, then

$$S = \frac{r-a}{\text{cosine}\ \omega}$$



It can be shown that if the arc length (s) is constant, then the difference in length between successive radii (r-a) will be constant also.





On the central rib (OQ) of a scallop (Pecten novaezelandiae) I marked off equal lengths (corresponding to the arcs AB, BC, CD, DE, etc.). With the callipers I measured the distance from the hinge to each of these marks (corresponding to OA, OB, OC, OD, etc.).

Lengths of successive radii (cm.)	Difference in length of radii (c .)	Arc length (cm.)
OA = 1.3	.5	AB = .643
OB = 1.8	.5	BC = .643
OC = 2.3	.5	CD = .643
OD = 2.8	.5	EF = .643
OE = 3.3	.5	FG = .643
OF = 3.8	.5	GH = .643
OG = 4.3		

These figures show that the curve (OQ) on the scallop is approximately an equiangular spiral with a spiral angle of about 37°.

In conclusion, measurement tends to strongly confirm that shells in their growth follow regular mathematical patterns. A possible extension of this investigation might be that in cases of distinguishing between closely allied species of similar appearance, any reliable difference in spiral angle could be used for identification.

Some Notes on The Land Molluscan Genus

CYTORA Kobelt & Mollendorff, 1897

By ROGER REES, Auckland.

In this article I wish to record some of my own personal observations concerning a few of the more interesting and perhaps familiar species belonging to the genus *Cytora.*

The genus consists of 18 species of relatively minute land snails inhabiting both the North and the South Islands. These operculate snails resemble some of our fresh-water species of *Potamopyrgus,* but inhabit native bush, being found alive only in damp places, such as gullies and under rotting Nikau fronds. Some species are local, while others are fairly widespread.

CYTORA AMPLA (Powell, 1941)

This is the largest of the *Cytora.* Spire elevated, conical; 6 whorls with a large body whorl; deep suture; small umbilicus. Sculpture consists of a few faint axial lirae, mainly on the body whorl. Colour a deep horny brown.

Height, 6.5 mm Diameter, 6.0 mm.

This snail seems to be entirely restricted to the tip of the North Auckland Peninsula. It is found in odd patches of bush around Pandora and Unuwhao, although it is fairly uncommon.

CYTORA PALLIDA (Hutton, 1883)

Shell of moderate size. Spire very elevated; conical; 6 whorls, becoming quite tight towards the spire, with large double-keeled body whorls; shallow suture; small umbilicus; sculpture in most localities appears absent, while in others a few axial riblets on the whorls are noticeable. Specimens from the Okuhu Valley near Kaitaia, have distinct bristles from the epidermis. Colour a deep harny brown.

Height 5.5mm. Diameter, 5.0 mm.

This species is perhaps the most common and widespread of the genus, being found throughout most of the Auckland Province. I have collected specimens at Kaitaia, Whangarei, Waiwera, Waitakere and Hunua Ranges.

CYTORA BICARINATA (Suter, 1907)

Shell large, squat, strongly built with a rather flat base. Spire short; whorls 6 to 6½ including 2 smooth protoconch whorls, and a large keeled body whorl. Aperture wide and circular; deep impressed suture; umbilicus small, deep, open. Sculpture consists of faint vertical lirae. Colour light horny, with a faint mottled pattern due to lighter irregular vertical bands diffusing towards the base of the shell.

Height, 5.0 mm Diameter, 5.0 mm.

This snail appears to have been found only in the Waipoua forest and surrounding country, where it is quite rare.

CYTORA ARANEA (Powell, 1928)

Shell microscopic, one of the smallest *Cytora,* Cylindrical in shape; 6 whorls, including a protoconch of two smooth whorls; deep suture; umbilicus small, open. Colour, pale horny. Sculpture consisting of pronounced vertical axial riblets, averaging 7 to the mm.

Height, 3.0 mm. Diameter, 1.4 mm.

I am uncertain as to the distribution of this species. I have collected specimens uncommonly at the Herekino Gorge, Northland, but this species seems to be absent from surrounding valleys and ranges. It probably occurs, however, in other areas of bush in Northland.

CYTORA HEDLEYI (Suter, 1894)

Shell small, squat; Spire short, conical; 5 to 6 whorls, with 2 smooth protoconch whorls; deep suture; umbilicus small, open, deep; rounded base. Sculpture consisting of evenly spaced prominent axial riblets, about 5 to the mm. Colour light brown.

Height 3.0 mm. Diameter, 2.6 mm.

This species seems to be found quite commonly around certain areas in the Auckland Province, although I have never collected or heard of it being collected in the far north. I have collected it in the Waitakere and Hunua ranges, also Mr. Whitten records it from the Thames area. (It is quite common in the Rotorua area.—Editor.)

References:

MORTON, J.E. "A Preliminary Study of the Land Operculate *Murdochia pallidum* (Cyclophoridae, Mesogastropoda)". Trans. Roy. Soc. N.Z. 80 (1), pp. 69-79.

SUTER, H. "Manual of N.Z. Mollusca" and "Atlas of Plates"

Shell Hunting in the Bay of Plenty - East Cape Area.

L. SEAGER, Auckland.

Mr. and Mrs. Gordon Hodge had a sudden inspiration that a visit to the above area would be a good idea for the low May tides, and invited me to join them. Four days after the idea was born we set out in the Volkswagen, hurrying through Rotorua and Opotiki arriving just before dark. No shelling was done on the way, but leaving Opotiki early Wednesday the first stop was Maraenui Beach, just south of Houpoto. A strong wind was blowing the tide about half way out. Banks of driftwood and seaweed yielded *Alcithoe arabica* and *A. swainsoni* in fair condition. Following the tide down *Spisula aequilateralis* were found in hundreds in the sand, and lying in living condition on the sand. These were just above low water mark and were of good colour, pale apricot and juveniles of pale lavender, and were of good size. Many were put into the bag. In the same area and *Struthiolaria papulosa* mostly adult, and were in the same depth below the sand. Xenophalium pyrum were found as washups.

As we were hoping to reach Te Kaha before the tide turned we passed on. Reaching Te Kaha we were disappointed that a strong wind was blowing but that did not prevent us from examining the various rock pools. Hunting in one of the tunnels the first find was a perfect *Vicimitra maoria.* A washup in this area was *Xenophaluim collactea* and one *Xenophalium labiatum. Modelia granosa* were also picked up and 2 *Ellatrivia memorata.* A little farther along the beach two yellow spots attracted my attention and lo and behold 2 *Philippia* lutea about four inches apart. A large *Cantharidus opalus* with the animal still inside but very dead was in a small rock pool.

Wanting to arrive at Waihau Bay before dark we pressed on and went directly to Mrs. P. Walker, one of our members, to find out the best place to camp and to deliver the May Newsletter which I had taken with me. Mrs. Walker kindly gave us permission to camp alongside her house and use her amenities, which kindly gesture was much appreciated. That evening we saw Mrs. Walker's collection and a little exchanging was indulged in.

The following morning, Thursday, with a 0.7 tide at 2.01 p.m., Mrs. Walker joined us, also Mrs. A. Richmond, a keen collector who has now become a member of the Section. Onepoto Beach was our collecting ground, and here we hoped to collect the lively golden limpets *Cellana radians flava* (Hutton, 1873). These were plentiful in the intertidal zone and to save time we worked our way down the cliff and worked hard to collect about 2 dozen each. Old and worn specimens were left to multiply. *Patelloida corticata corallina* (Oliver, 1926), in the same locality, were nice clean specimens, and a number were gathered. Onepoto Beach has a good reef with both deep and shallow channels, also a large flat rock with numerous pools. Zostera and other weeds abound. Rock pools yielded *Maurea punctulatum* were found alive and also crab inhabited, and a *Maurea tigris* in good condition was also picked up. *Paratrophon stangeri* were on the rocks in the lower intertidal zone, and *Mayena australasia* were found deeper down in the pools under the rock ledges. These were small but perfect. *Zeatrophon ambiguous* was also taken from the pools alive.

By this time we were feeling peckish and lunch was the order of the day. Mrs. Walker suggested that to obtain the best of the low tide we retrace our steps and go back to Orete Beach to a long reef south of Waihau Bay.

The tide was just turning and the first find was a large perfect *Barbatia novaezelandiae* under a rock below the extreme low tide mark. Haliotis iris were plentiful in the same region but were of small size and all were under rocks. We did not find one *H. australis* in this locality. Slightly higher up the tidal zone were *Marginella mustelina* and *Marginella pygmea* both under smooth stones with a sandy base. By this time the tide was getting a bit high and we became beachcombers. Here were our best finds of the day, *Vicimitra maoria* quite a number, and more specimens of *Ellatrivia memorata* than I have seen at one time, well marked, high up on the beach. It was really a thrill.

The following day, Friday, 13th, we set off four of us and two children for Matakaoa Station at the northern end of Hicks Bay. On the way we stopped at the Cape Runaway cutting where the subfossils can be dug out of the bank. A number of shells were collected including one perfect Alcithoe, some Maoricolpus, a large oyster, large Pectens and some smaller shells.

Matakaoa Station was reached, a glorious warm day with bright sunshine and no wind. Just the perfect day for collecting. An early lunch was the order of the day, and a very hurried one too as the lovely flat reef with its numerous channels and rock pools was calling too loudly to be denied.

This particular spot is remarkable, for the flat reef just splits here and ends in sudden deep water, so very deep that *Hapuka,* a very deep water fish, may be caught off the reef. This will give some idea of the depth at this spot.

Although this was said to be Black Friday it was not to be for us, in fact it was our lucky day.

One deep pool investigated by three of us yielded live *Cantharidus opalus* feeding on the mossy green weed below the seaweed looking like lovely rose pinkpoints deep down in the water. Also found were live *Maurea tigris, Maurea punctulata* and one *M. pellucida* which seemed to have hybridized with *M. spirata* as the spire was somewhat taller and sharper than the usual *M. pellucida.*

Then alive in an outer pool, one floating and one feeding on the mosslike weed were one *Phillippia lutea* and one *Architectonica reevei.* In this particular pool were also two *Vicimitra maoria,* both alive. The latter were a little deeper in the pool and required a dive to reach them. A large number of *Haliotis iris* and *H. australis* were deep down in the pools. Large specimens and a bit difficult to remove as they had fastened themselves in holes and under ledges, but with a thought to breakfast as well as large shells quite a number were gathered. Large *Buccinulum lineum* and *B. multilineum,* clean, large and strongly marked were slightly higher in the tidal belt. One pool attracted me when I noticed a large *Cantharidus opalus* about twelve feet down feeding on the same mosslike growth that the previous specimens had been noticed feeding on. Down I went and unfortunately dropped the shell as I just failed to reach down low enough. However, I made two more dives but the water was too cold and the depth too great for my limited breath, and one shell got away to live another day.

Dead shells in this area included *Modelia granosa,* large and fairly clean, more *Vicimitra maoria, Astraea heliotropium* (1 very large specimen and two smaller ones). A large *Murexsul octogonus* and some large *Maurea tigris.*

Here on the higher tidal shelf were large clean limpets, *Celiana stellifera stellifera, Notoacmea pileopsis pileopsis.*

Well the most interesting holidays must end and we were not really ready to leave this wonderful hunting ground before we were on our way home. Mrs. Walker accompanied us part of the way back and we stopped at Waiorore Beach, where the high tide prevented anything else but hunting washups. These included *Xenophalium labiatum, Ellatrivia memorata, Pupa kirki, Marginelia pygmea* and *Micrelenchus dilatatus.* Bidding a reluctant farewell to Mrs. Walker we made for Waitahi Beach. This sandy beach yielded *Poireria zelandica, Xenophalium pyrum* (plentiful), *Struthiolaria papulosa,* fine perfect shells, well marked, some with the animal still very smelly. Half valves of *Resania lanceolata, Divaricelli huttoniana, Longimactra* elongata and *Cardita aoteana* were found. *Myadora striata* and *Bassina yatei* were also seen and some large specimens of *Janthina violacea.* A good specimen of *Chlamys zelandiae* was found in a piece of sponge.

Pikowhai Beach was the next port of call and more *Xenophalium pyrum* were found but the rest of the beach was a mess of broken shell. Our last call was at Maketu where the storm that had been threatening for the last few hours looked like breaking. The wind was strong and the waves fairly high so we made along to the Maketu estuary where numerous small shells were found. These included *Tanea zelandica* and *zethalia zelandica, Baryspira australis* and many *Struthiolaria papulosa.*

Now the storm was really working up so we headed for home and warmth after having six wonderful days and with many thanks in our hearts for the kindness received from Mrs. Walker and Mrs. Richmond without which we would not have known the best localities to search for our treasures.

New Locality Records for some Marine Molluscs

By P. WARREN, Leigh.

Quite recently I had some shells sent to me for identification by Mrs. K. P. Walker of Waihau Bay, Opotiki. They were collected by Mrs. Walker from the beaches of her home district, and as some of them have not been previously recorded from the Bay of Plenty, I think they are well worth commenting upon.

Pteronotus eos (Hutton). A half grown specimen. This has been recorded from the northern end of the Coromandel Peninsula and from Port Fitzroy, Great Barrier Island. Apart from that I do not know of it anywhere south of the Whangarei Heads. So far it has not been seen around Leigh or in the Hauraki Gulf. The shell is a pale one which recalls the pink rather than the yellow variety.

Pellax huttoni (Pilsbry), *Pupa kirki* (Hutton), *Cylichnina striata* (Hutton). These three have, I think, been collected at Mount Maunganui. In the present collection their range is extended to Te Kaha.

Vicimitra maoria (Finlay) 4 specimens. It has previously been recorded from East Cape and the Bay of Plenty in Suter's Manual, and more recently from Te Kaha by Mrs. R. L. Matthews. Specimens from Waihau Bay agree well with the ones from Cape Rodney and Northland; though rather beach worn their condition is better than usual.

Proximitra obscura (Hutton). Mostly from East Coast beaches north of Tutukaka. It has, however, been dredged near Mokohinau Island and recorded from there as *Mitra albopicta* (Smith). This seems to be the first time it has been collected so far south.

Austromitra antipodum (Brookes), *Austromitra erecta* (Powell). These two species in company with *A. rubiginosa* (Hutton). Apparently *A. rubiradix* (Finlay) is not present. I have collected all four in shell sand at Goat Island beach, Leigh, and from the Barrier I have *rubiginosa, rubiradix* and *antipoda,* but not *erecta.* The type of *erecta* is from Whangaroa. *Rubiginosa* is well known from the Bay of Plenty beaches, but I think *antipoda* and *erecta* are both new records.

Mammilla simiae (Deshayes). Two specimens, one quite big. Authentic records of this shell in New Zealand are rare. I know of the following definite occurrences: Takou Bay (C. H. Robinson); Tapeka Point, Russell (K. Hipkins); Oruawharo, Great Barrier Island (G. Mitchener); "North Auckland" (Bollons collection, Dominion Museum).

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CONCHOLOGY SECTION OF THE AUCKLAND MUSEUM

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CONCHOLOGY SECTION AUCKLAND MUSEUM

BULLETIN No. 17

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Editorial

Ten years ago Bulletin No. 7 appeared as the first issue of the printed number that we have come to look forward to towards the end of each year. Now, once again, it is our pleasure to present this, our seventeenth Annual Bulletin, containing original articles by members.

This year has been a stimulating one. Our membership continues to grow and now includes several overseas members. A pleasing aspect of the membership is the increasing number of young people who have lately joined, their keenness being an inspiration to us all. Monthly meetings are very well attended as are also our Field days which owing to the enthusiasm accorded them are becoming more frequent.

Once again we express our gratitude to our Patron, Dr. Powell, for making the splendid accommodation and facilities we now enjoy available to us; and also for the valuable lectures and and study groups he has held throughout the year.

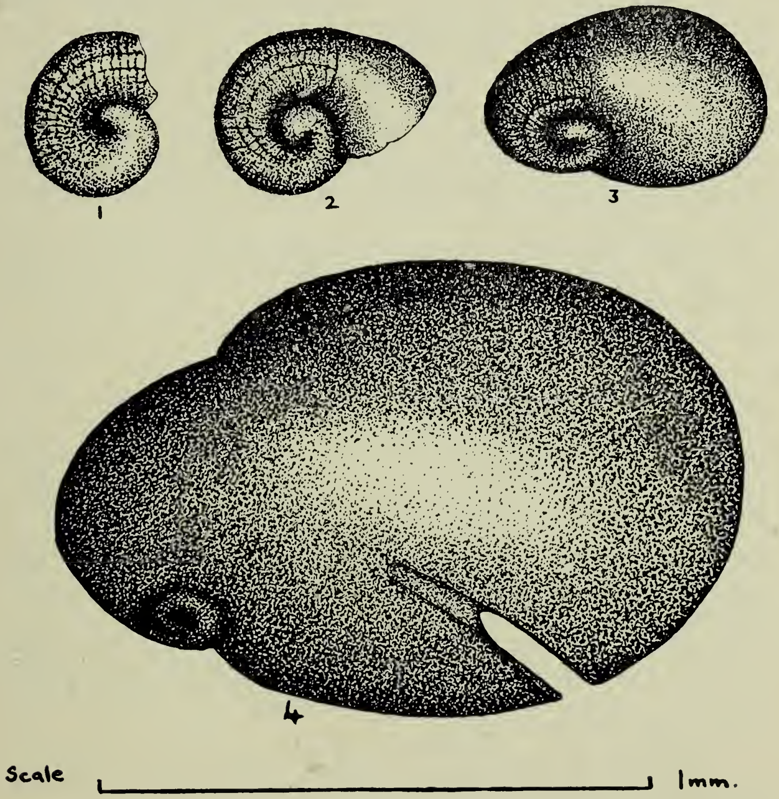
We must also express our thanks to all members who have given most interesting talks at monthly meetings, and all others whose co-operation and goodwill have ensured both the smooth running and good name of the Section. As we are primarily an amateur body run by amateurs for amateurs, our ultimate future and success is in the hands of us all. Next year will be the thirtieth anniversary of the Club's inception, and arrangements are already in hand to ensure that the occasion will not pass unobserved; following which we look ahead with confidence to the next three decades.

◆

Incisura lytteltonensis (Smith, 1894) From Cape Rodney

By S. G. HULME

During April 1961, various seaweeds and seaweed washings were collected from rock-pools on the seaward coast of Cape Rodney. A number of mollusca and foraminifera were found to be living on branches and amongst the holdfasts. *Incisura lytteltonensis,* and a species of foraminifera *(Discorbis dimidiatus)* occur fairly commonly on a short, tufted, brown seaweed (probably a species of *Sphacelaria). Incisura* and *Discorbis* were the only species found actually living on the branches or fronds, and only rarely did these species occur on other larger seaweeds.



Incisura lytteltonensis (Smith, 1894).

The foraminifera is an attached form, and well suited to withstand the incessant turbulence of a rough, rocky, wave-swept coast. Also *Incisura,* comparatively smooth and limpet-like in general outline, is capable of sticking fast under very rough conditions. Individual blades of the algae are smooth, well branched but narrow, being the shape of a rather flattened oval in cross-section. Only very small species could maintain a safe anchorage under these conditions.

Small clumps of the algae were found at low-water level, on the edges of rock-pools and crevices, but at no one spot was it very common.

Numbers of *Incisura* at various growth stages were picked out and mounted; from these, four specimens are figured showing development from the juvenile (fig. 1) (probably soon after hatching from the egg), to the adult specimen (fig. 4). A notch usually develops when the shell is almost half-grown (fig. 3), and develops into a deep incision in fully adult specimens.

The Cape Rodney specimens have been compared with material from a number of other localities, as well as specimens from the Suter collection. All compare very closely, but these living specimens exhibit fine details not readily distinguishable on dead examples.

The main body whorl is smooth, showing only very fine, irregular growth lines, apart from traces of the partly filled in incision as the shell grows. Juveniles display moderately coarse growth riblets, often broken with a series of finer spiral chords approximately 4 to 6 in number.

The writers wish to express their thanks to Mr. and Mrs. T. P. Warren for their kind hospitality during the period when this material was collected.

Tips For Collectors

By ALMA MORGAN

To those inexperienced in collecting live specimens of New Zealand shells and wishing to spend a conchologist's holiday during their annual leave, do make sure on the following points:

TIDES: Plan well ahead if possible and choose your lowest tide. The Marine Department, Customs Street, Auckland, issues a Tide-Table for all New Zealand a year in advance. This is generally obtainable round about August, and costs 5/-.

September and October of 1962 have *minus tides*. This means that rocks and ledges covered with water the year round will be uncovered and if you ask the Weather Prophet for an off-shore wind, then conditions will be ideal.

LOCALITY: You may be able to choose your locality or circumstances may settle it for you, but make yourself familiar with shells likely to be collected in that area.

Dr. Powell's book, "SHELLS OF NEW ZEALAND" has a chapter on "The Distribution and Zoning of our Shell-fish". After the name of each illustrated shell, the particular zone or area where it may be hunted for is also given.

Some shells are easily distinguishable but remember that nature has endowed them with an excellent camouflage. Therefore it is very helpful and is far easier to spot a new specimen if you have seen the actual shell beforehand.

ROCKS AND LEDGES: After turning over rocks always replace them in the same position but before doing so, study it for a while and it will be amazing what your eye will find.

At dead low water, stop by a ledge and peer under it. Wait till your eyes become accustomed to the darkness, and you will find odd shapes will begin to take form. The dark brown slug like *Cryptoconchus porosus* Burrow ("Butterfly-shells") is often found in this habitat.

Good hunting! Remember that Rome wasn't built in a day and neither are experienced conchologists. It takes patience and time!

Some Notes From Stewart Island

By ELSIE SMITH, Halfmoon Bay, 15.9.61

The most interesting finds this year have been the following, which include three new records, one of them a member of the octopus family.

Potamopyrgus antipodum zelandiae (Gray). These were collected by Mrs. S. Leask from fast-running water about a quarter of a mile up the middle gully at the North end of Mason Bay. In another creek just over a ridge, she finds the spiny species common on the Freshwater Flats.

Alcithoe (Leporemax) fusus (Q. & G.). Several specimens were trawled in 30 fathoms at Chew Tobacco by Mr. J. G. Sutherland of Timaru. Another new record.

Plurigens phenax Finlay. These also were trawled by Mr. Sutherland at Chew Tobacco. Both the shell-outline and the strength of the sculpture vary considerably. In two almost circular specimens the ribbing though characteristic is weaker than usual and there is a peculiar colour pattern of thin light brown radial lines.

Mysticoncha harrisonae Powell. Mrs. George Fife, another section member, has a second specimen of this shell, taken by her husband from a cod stomach in 35 to 50 fathoms off Port Adventure.

Siphonaria sp. Referring to my last year's note about a fan shell living inside another (live) fan shell, Mrs. George Fife has a *Siphonaria* which she found alive inside the animal of an oyster. The shell is small and deformed, the sculpture reduced.

CEPHALOPODA

The midget octopus, *Robsonella australis* (Hayle), is generally found only in fish stomachs and oyster culch at Stewart Island; but recently a local boy, Simon Goomes, has collected some from rocks at Halfmoon Bay.

A larger midget octopus, *Robsonella huttoni* Benham, is, I think, a new record for Stewart Island. The writer took one adult male 6½ inches long and a smaller female from the stomachs of cod caught in the North Island Passage in 25 fathoms. Ten days earlier (27/5/61) Mr. R. T. Dawson had mentioned that where he was fishing off Port Adventure the cod were full of "tiny octopus about one inch long", and he brought in three specimens on a lump of cellapora. These proved to be young of the same species, one and one third inches long. Later (23/8/61) Mr. E. Hopkins noticed some "little octopus with a spread of about 14 inches", near the South Cape, when *Octopus maorum* had a spread of about 4 feet. Quite likely they also are *R. huttoni*. When fresh the smaller specimens were amber-coloured wherever the thin dark skin had been rubbed off, and had a conspicuous pattern of squared brown spots down the middle of each arm, another row of very small ones on each side of that, and scattered spots on the head, the neck and the underside of the body. There was a slight flap around the body, but in formalin both this and the dark skin have disappeared, although the spots remain. The larger specimens had no spots, and when fresh were clouded with minute red dots, darker on the middle of the back. Formalin has turned them to reddish brown with pale undersides to the body.

The squid, *Nototodarus sloanii* (Gray), seems to be fairly well established here now. Up till 1959 I had only the one record, about 1930, when my husband's fishing-mate caught one on the line. As he brought it to the surface, it squirted water full in his face, and he dropped it back in again. When he brought it up again, it again squirted him in the face. This is a thing the octopus does not do. Of more recent years none of the men I had approached could recall ever seeing a squid. But in March and April of 1959 on some grounds the cod and groper stomachs were full of them. Mr. J. Aitken counted 300 in 3 days' fishing. Mr. R. H. Traill reported seeing them often when floundering in Paterson Inlet, and on rocks at low tide. Mr. A. P. Hamilton saw what he judged to be at least 400 in a rock-pool behind Bravo Island in Paterson Inlet, in either September or October, but is not certain of the year. He says that they were about 15 inches long, with pinkish arms and pale grayish bodies, and when he waded among them in his gum boots they shot off in all directions. This year the only record I have was in May when Mr. G. Fife said he had never before seen so many in the cod, and that they were of all sizes. He brought in a young specimen in which the arms were still enclosed in a membrane and looked like a parrot's beak. At that time he was fishing on the North Grounds off Port Adventure in 35-50 fathoms.

Onichoteuthis banksii (Leach). Some brick-coloured squids which came ashore at Halfmoon Bay two years ago appeared to be of this species: I have not heard of any being seen since.

An old but interesting record is that of a giant squid which came ashore on the beach at Mason Bay. Mr. A. W. Traill measured one of the arms with a foot rule and found it to be 30 feet long. The body had collapsed and was half buried in the sand, but he judged it to be about 20 feet long.

In addition to the above, and of course the common *Octopus maorum*, an occasional paper nautilus (*Argonauta nodosa* Solander) is washed ashore, while *Spirula* are found on the beach at Mason Bay.

Octopus is a very favourite food of the blue cod, and the size of the pieces which they can swallow is astounding. A cod a foot long will contain a chunk as big as a man's fist. This of course is promptly used by the thrifty fishermen as bait to catch more cod. Mr. C. Yunge, an old resident of Stewart Island, has described the method used by the cod in attacking these large animals. At The Brothers, near Pegasus, he sat in a dinghy in shallow water over sandy bottom, and watched three blue cod attack a full-grown octopus. They darted in and each grabbed an arm. Then they pivoted round and round until the arm came off. Until comparatively recent years, the fishermen lost a fair proportion of their catch owing to this pivoting habit. On the way up the blue cod would wind the whole side-line round the shank of the hook till the barb tore out of its upper jaw and released it. The use of swivel hooks prevents this nowadays.

Finally, to illustrate the strength of the octopus, my husband tells of a fishing mate who used to tie one end of a cod line to an octopus and the other round the mast. The octopus would splay its arms on the deck and "take the strain". They "could play tunes" on the line, and after a while it would break.

The Freshwater Mollusca Of The Far North

By N. GARDNER

There does not seem to be any previous record of fresh-water shells from the northern tip of N.Z. — that triangular block bounded by Cape Reinga, North Cape and the Parengarenga Harbour, and considered at one time to have been separated from the rest of Northland. The comparative recent formation of the Ninety Mile Beach, has again tied the area in question to the mainland.

While the land snails have undergone a considerable degree of speciation and interesting new forms have evolved, the fresh water molluscan fauna appears to have remained stable and unchanged. This, of course is not unexpected, as the narrow sandy stretch of country behind the Ninety Mile Beach does have a few small sluggish streams and lagoons which would probably allow for a comparatively recent interchange of basic stock, thus cancelling out any hopes of noticeable divergence of form due to prior isolation.

There is one species that has been effectively restricted, *Latia neritoides* which requires of its habitat cool running water and a stony or rock bottom. These conditions are not available on the sandy isthmas. There does not appear, even so, to be any difference in shell shape, though northern specimens are of comparatively smaller size.

The following species have recently been collected from the Far North:

Hyridella menziesi Gray. Waterfall Bush, Kapuwairua, The Huka, Te Paki Stream near Homestead. Not uncommon.

Melanopsis trifasciata Gray. Kapuwairua, The Huka, Cape Reinga, Te Paki Stream. Extremely plentiful, though of no great size.

Potamopyrgus antipodum, antipodum Gray. Kapuwairua, The Huka, North end of Waikuku Beach. Very common, not of great size.

Potamopyrgus corolla corolla Gould. Kapuwairua. Common.

Potamopyrgus corolla salleana P. Fischer. Kapuwairua. Not uncommon.

Planorbis corinna Gray. Swamp behind Spirits Bay. L. Price.

Latia neritoides Gray. Under rocks, above waterfall Bush, Kapuwairua. Rather scarce.

Gundlachia neozelanica Suter. Under waterlily leaves, Lagoon at Whareana, North Cape. Common.

(*Simlimnea* and *Physastra* were not found. The most northerly record I have of these is from Waiperara Lake, north of Waipapakauri.)

Bits And Pieces From Here And There

By T. P. WARREN

The common Rock Oyster, *Saxostrea glomerata* seems to be now well established in some parts of the Kaipara Harbour and during the picking season many sacksful are obtained. For the past two years we have been able to buy quite a number from the depot at Wellsford; the shellfish are of good size and flavour and compare well with their counterparts from the outer islands in the Hauraki Gulf. When gathered the shells are put into large revolving drums like concrete mixers to free them of debris and their sharp edges and so on, so they do not emerge as suitable specimens for the collection, however their gastronomic appeal outweighs this disadvantage.

Specimens of *Pecten novaezelandiae* taken from the Kaipara Harbour mostly show an inside coating of a rather attractive metallic purple colour. So far I have not seen shells from other localities with a similar staining. It could possibly be an effect of some of the minerals suspended in fresh water carried into the harbour by the numerous streams which flow into it.

Not long ago a number of juvenile specimens of *Monoplex australasiae* were washed ashore at Pakiri Beach in company with numerous other small molluscs. All were equipped with perfect protoconchs, a feature which all too often has disappeared in adult specimens.

The small Trochoid, *Thoristella carmesina,* still occurs on rare occasions at Goat Island Beach. During the past year specimens have been recorded from Whangaroa (dredged), Whangarei (Tarakihi stomachs) and in washup at Oruawharo, Great Barrier Island. The latter are much larger than usual, and a brilliant shade of carmine which typifies the species. I have, however, seen and collected specimens which range from a pale buff through pink to blue-green. All these retained the typical red apex despite the other colour mutations.

Also at Goat Island Beach, *Marginella maoriana,* though not at all common, is found in washups from time to time. Only empty shells have been obtained and it is very likely that the mollusc lives on the sandy bottom some distance off shore.

The tiny land snail, *Elasmias subperforata* has recently been taken near Collingwood, West Nelson. This would appear to be the first South Island record of this species. It has been collected along the Manawatu coast, at Kapiti Island, and is common all round coastal Northland and Great Barrier, mostly in sand dune vegetation. The companion species, *Tornatellinops novoseelandica* is more often found on moss-covered trees in shady parts of the bush. It is widespread throughout the North Island and also at the Three Kings which is of interest as most other molluscs from there are endemic. Good figures of both these snails are in Suter's Atlas, Plate 30, figs. 12 and 13.

A fisherman friend recently sent me two empty specimens of *Charonia capax* which were taken in crayfish pots at Jacksons Bay, South Westland. Both are smaller than northern examples, however they serve to extend the known southern distribution of this mollusc. The other N.Z. Charonia, *C. rubicunda,* seems to be now well established in the Manakau Harbour. I can include Cape Rodney in the other locality records. Two small specimens were found there in crayfish pots by the late Mr. T. H. Ashton in 1954.

The common window-shell, *Anomia walteri,* seems to come and go in many places. Quite large specimens are found in parts of Auckland Harbour but they lack the clear yellow-orange tint of specimens from clean water situations around the coast. A couple of years ago Anomia was quite abundant on papa rocks at the south end of Orewa Beach but has since vanished from there. Similarly it was to be found in quantity at Ti Point near Leigh but not now, yet it is established in Leigh Harbour where once its absence was most conspicuous.

A recent visit to Ti Point showed that the rare Venerid bivalve *Dosinia maoriana* is still living in coarse sand at low tide, one of the very few places where the species is to be found in living condition.

Some Observations Of Notoplax cuneata (Suter, 1908)

By ALBERT H. JONES

Notoplax cuneata is unique in that, unlike most of the other Chitons, which are rock dwellers, it inhabits sand flats, where it moves about just under the surface. The valves, when separated from the mantle, and mounted, show many attractive colour shadings ranging from green, pink, lavender, and various combinations of these colours.

Ideal conditions for collecting are, calm weather and low water at a spring tide period, it is then possible to see, and follow up the trails, which are in the form of a small raised ridge in the sand left by the animals as they move along. *Baryspira australis* leaves a similar trail, and is found in association with *N. cuneata.* The chances are five or six *Baryspira* will be turned up for every *Notoplax,* however should the collector find in the vicinity of ten or a dozen *N. cuneata* over the low tide period, he or she may consider they have done very well.

Over a period of years from 1950 up to and including 1958 the writer has collected specimens of this rare Chiton, on a small restricted beach area above the Salisbury wharf at Mount Maunganui, on the Tauranga Harbour.

Unfortunately this beach area is now lost to collectors due to the march of progress. The Mount Maunganui new port development scheme, has swallowed up the beach and the low tide foreshore has been dredged to provide wharf berthage. During October 1958, the last occasion on which *N. cuneata* were collected, a small hand dredge was used, thus enabling water up to a depth of two feet to be worked. By this method, a number of specimens were obtained from an area outside a rock filling which formed part of the wharf extensions.

During October, 1951 and prior to the wharf extensions encroaching on to the Salisbury Beach, the writer had the unique experience of collecting *Notoplax* at high tide. Dozens of these were washing up to become stranded on the beach. They appeared to have died recently from some unkown cause, but were not decomposed in any way. Over a period of four days, some 200 specimens were obtained from a small area of beach above the known bed.

The suction dredge also provided a number of specimens during October, 1958. The intake end of the dredge had apparently been working the home ground during the past week, and had brought up sand containing *Notoplax, Baryspira* and other shell fish.

Over the weekend, when the dredge was not working, the spillway, a planked-up area to hold the sand and allow the water to drain away back to the sea, had run dry allowing an inspection to be made, many *N. cuneata* were found stranded above, and among the rocks below the spillway. A number of these were lodged in damp places in the sand and were found to be alive.

A species of shell fish which were found in this dredged area also, but to my knowledge, were not previously found below this wharf were quite common after dredging operations in 1959. This shell was the beautiful pink turrid *Phenatoma novaezelandiae.*

NOTE: Mr. Hipkins reports in No. 8 Bulletin having found *Notoplax cuneata* also living in conjunction with *Baryspira australis,* on sand flats at Whangateau Harbour, near Leigh. The species is not therefore limited to the Tauranga Harbour and may also be found elsewhere.

Size Variation in a Single Population of Scutus breviculus (Blainville)

(MOLLUSCA-FISSURELLIDAE)

By R. A. CUMBER, Palmerston North

A washup of some 320 specimens of *Scutus breviculus* (Blainville) was collected at Waitangi, Bay of Islands on 15.9.60. These specimens, which still had portions of the animal adhering, were taken from a small stretch of beach about 75 yards in length which is faced by an area of rocky channels. Individuals of all sizes, except

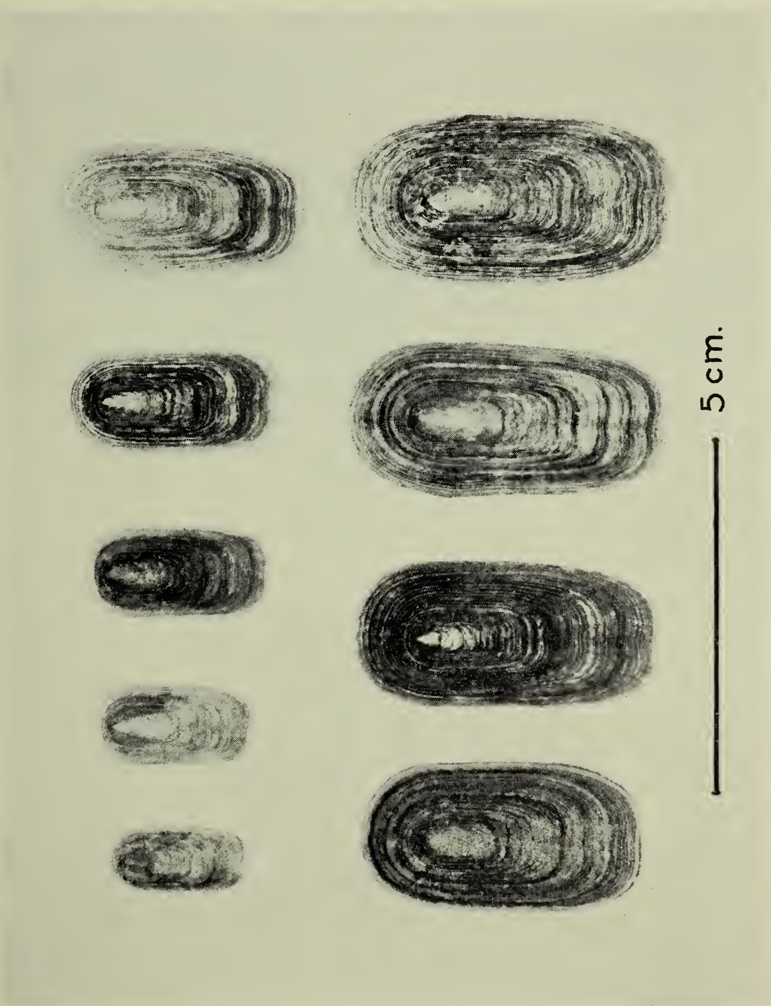


Fig. 1. The various sizes of *Scutus breviculus* taken at Waitangi on 15.9.60.

very large ones, were present with the middle-sized ones predominating (Fig. 1). It is assumed that the rough weather was responsible for dislodging the shells but the high percentage of fresh water from prolonged flooding of the Waitangi River may have been partly responsible for their mortality.

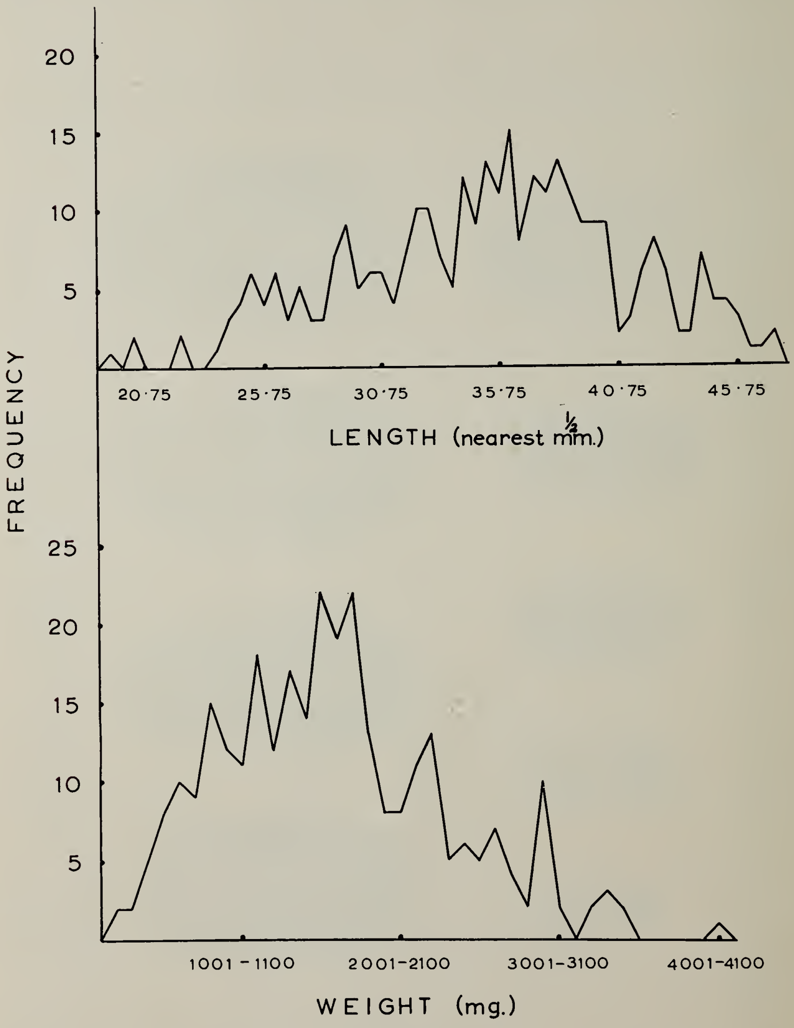


Fig. 2. Frequency distributions of length and weight for 320 specimens of *Scutus breviculus* taken at Waitangi on 15.9.60.

The purpose in taking such a large series was to determine whether they could be separated into age groups. Many specimens showed a series of concentric grooves which could indicate years of successive growth. The length and weight of each shell was determined and this information is presented in the form of frequency distributions (Fig. 2).

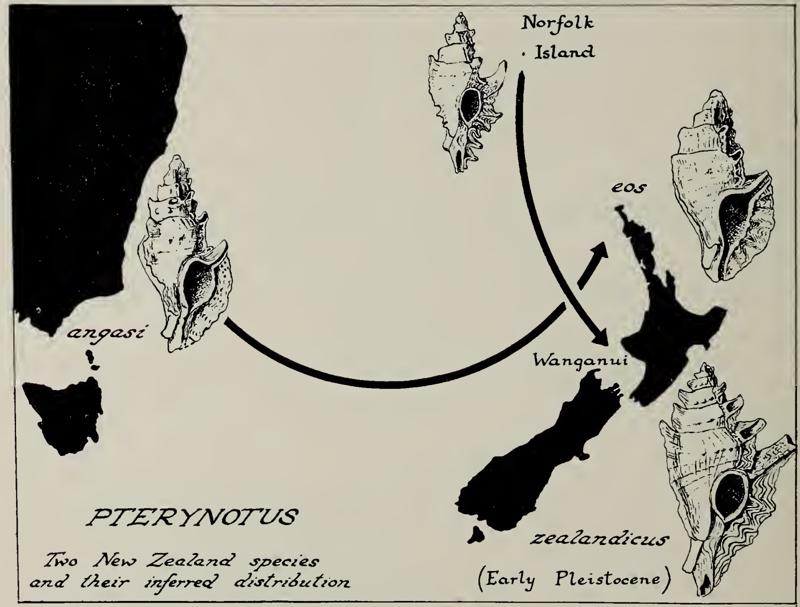
Although the distributions do show series of successive peaks, these are not sufficiently regular to indicate the yearly broods concerned. One can only assume that there is considerable variation in the growth rates of individuals from the one generation in the one locality. The concentric irregularities show a rhythm suggesting that average-sized specimens may be as much as 5 years of age, and the largest one perhaps 8 years.

A Marine Molluscan Link Between New Zealand and Norfolk Island

By C. A. FLEMING, New Zealand Geological Survey, Lower Hutt

Throughout the Tertiary Period, and in the interglacial ages of the Quaternary, the New Zealand molluscan fauna has gained immigrants from more tropical areas to the north-west and north. Many of the warm-water invaders (e.g. *Tonna tetracotula* Hedley) probably came by larval drift across the Tasman from Australia, and it is rather rare to find a species so restricted in its distribution to the north of New Zealand that we can pinpoint a source area in the South West Pacific to demonstrate that some elements came from the islands to the north. One such form is *Xenophalium royanum* (Iredale), which lives at the Kermadec Islands and off Northland. The small murex which is the subject of this note is apparently the first evidence that a marine mollusc from Norfolk Island, 500 miles north-west of New Zealand, at one time colonised New Zealand; there is one Norfolk Island species, *Cominista norfolkensis* Iredale, which is evidence of movement in the opposite direction.

Pterynotus (Poropteron) zealandicus (Hutton) is a distinctive species known only from the Tainui Shellbed of Castlecliff and Wanganui Valley, and as derived fossil shells from the west coast beaches of Wellington, probably washed down from Wanganui. At Castlecliff it is quite common in the Tainui Shellbed, but has never been found in another formation. It is thus restricted to a small zone in the Putikian Substage of the Castlecliffian Stage in the Early Pleistocene. The Putikian is thought to be the second interglacial age of the Pleistocene, when warm waters moved south after a glacial age represented at Wanganui by fossil pollens of cool vegetation and by impoverished marine faunas in the preceding Okehuan. Several other warm-water molluscs are known from the Putikian of Wanganui (*Zelippistes, Eunaticina, Cymatilesta, Anadara)* and as *Pterynotus zealandicus* has no known ancestors in New Zealand, it is likely to be an immigrant from the north. As Finlay pointed out, it differs markedly from the Australian and modern Aupourian species of *Pterynotus (angasi* Crosse; *eos* Hutton), particularly in its closed canals and hence oval tube-like false aperture, formed by outward extensions of the parietal and outer lips, and in these characteristics it approaches *P. uncinarius* (Lamarck), the South African type species of *Poropteron* Jousseaume. There is no need, however, to seek the origin of *P. zealandicus* as far afield as in Africa: there is a closely related species still living in Norfolk Island, which is thus the probable source of the short-lived Early Pleistocene New Zealand invader.



PTERYNOTUS

Two New Zealand species and their inferred distribution

The Norfolk Island shell was collected by Roy S. Bell and H. C. Quintal in 1913 and again by Dr. Hugh Marwick, now of Stoke, Nelson, in 1943. It is represented by beach-worn shells in the Dominion Museum, Wellington, in the New Zealand Geological Survey, Lower

Hutt, and in the Australian Museum, Sydney, but it has apparently never been described or named. It is similar to *P. zealandicus* but is distinguished by its smaller size, more slender shell, less continuous frill on the varices, and by the upward curve of the adapical tube representing the exhalent canal. The elements of spiral and axial sculpture, the spacing of the varices, closure of both adapical and abapical canals, the disposition of spines on the varices, and the oval tube-like apertural extension are essentially the same as in New Zealand fossil, so that there can be no doubt of its close relationship. Most of the specimens are white, but a few are faintly pink. The largest I have measured is 23 mm high, whereas *P. zealandicus* reaches a height of 30 mm.

On the data available to us, therefore, we must conclude that this little murex lived in the islands north of New Zealand in the Early Pleistocene, and at least once, in the warm period we attribute to the second interglacial age, it spread southwards to enter the New Zealand region as far south as Cook Strait, there developing a more elaborate frill and reaching a larger size. The third glacial period, which followed the warm Putikian, brought such cold climates to New Zealand that many organisms were exterminated. On land, large-leaved Southern Beech trees *(Nothofagus),* of a type which had been in New Zealand since the Cretaceous, were completely exterminated, although they persist in the mountains of New Caledonia and New Guinea. In the seas of New Zealand, *Pterynotus zealandicus* and several other warm-water species became locally extinct.

A word may be said of the other New Zealand species of *Pterynotus,* the rare Pink Murex of Northland, much sought-after by collectors *(P. eos* Hutton). Its closest relations are the populations of *P. angasi* Crosse which range around the Australian coast, showing some variation in their shell form and colour. In New Zealand, this type of *Pterynotus* has been present at intervals since the Lower Miocene, and ancestors of *P. eos* appear in the deposits of both the first (Marahauan) and second (Putikian) interglacials of Wanganui, whereas living *P. eos* is restricted to the Aupourian. The Pleistocene fossils resemble *P. angasi* in some characters, so *P. eos* is probably an Australian element in New Zealand, in contrast to *P. zealandicus* which seems to have come from the north.

I have not seen specimens of small *Pterynotus* from Lord Howe Island or New Caledonia, and would welcome the chance to borrow any specimens that are available from readers of this article.

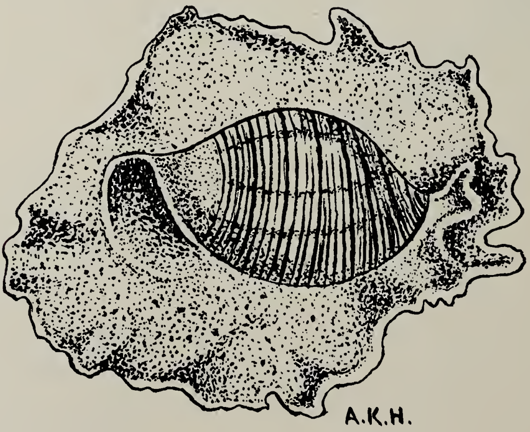
One Of My Greatest Treasures
HYDATINA PHYSIS

By P. JOHNSTON

Early in March while staying with Mr. and Mrs. Keene of Te Paki Station in the far north, my hostess took me on a shell collecting outing to Te Pua Point situated on the southern side of Parengarenga Harbour.

Although the water was right up to the bank when we arrived, as the tide dropped a large expanse of sandy mudflat became exposed. We launched a small dinghy with outboard motor and Mrs. Keene's son Rex landed Lesley, her daughter, and myself over on the White Sands immediately opposite the wharf. Rex then took off to fish and Lesley and I to walk to the South Head a couple of miles away. Mrs. Keene elected to stay and just hunt about on the mudflat as the tide fell. Lesley and I were hoping to find *Tonna, Poirieria zelandica* and large *Haminoiea zelandiae* all of which we had collected in this area on two previous occasions at this time of year. Not even a broken piece of any one of these shells could we find though we walked a mile down the open coast south of the South Head.

It was about three hours later when we arrived back, having been picked up by Rex who had a very good haul of fish.



We were greeted by Mrs. Keene saying she had something very strange to show us. She had been hunting around the mud-flat to the right of the wharf when she saw a bright pinkish-red slug. She gave it a nudge with the toe of her sandshoe and found that it seemed a little solid. She wanted to keep it to show us but didn't fancy picking it up by hand so went back about a stone's throw to the car to get a fish hook with which she picked it up and transferred it to a spare handkerchief. By this time she had discovered that the slug had on its back a shell she had never seen before.

When she showed it to me, I recognised it immediately as being the very rare *Hydatina physis,* having seen the specimen Mrs. Morgan brought to the club a couple of years ago. You can imagine my reaction when I knew it had been nudged by a sandshoe and then picked up on a fish hook!

Mrs. Keene very generously said she had found it for me and it was mine. It did not take any persuasion to induce me to accept this wonderful find. When found, the mantle completely covered the shell which was lying on top of sandy mud. Later, when put in a saucer of seawater, it spread itself right out. It was a rich bright pinkish-red with a very fine bright emerald green line around the edge of the mantle.

I put it into a jar of ½ meths and ½ water but the animal turned brown and withdrew practically into the shell. Before I left Te Paki to come home I removed the animal from the shell but the hard brown rubbery substance bore no resemblance to the beautiful thing it had been. The shell had not been damaged by its treatment and is now one of my greatest treasures.

A Collector Overseas

By ALMA MORGAN

TRUE FACTS: A conchologist travelling with an architect is apt to get a kink in the neck instead of a kink in the back. Shells are conspicuous by their absence.

In Athens, this conchologist tiring of a kink in the neck through constantly admiring buildings, was to be seen crawling among the ruins of the famous Parthenon searching for snails and assisted by one of the officials. Neither of them could speak the other's language but what did that matter!

SAN FRANCISCO: Fisherman's Wharf; A ride in a cable car driven by a very spectacular driver — a short walk, and one is transported into another world — a world of the ocean and its treasures. The wharf is lined with quaint stalls jammed together and filled with wonders from the sea. Shells of all kinds are jumbled and tumbled together in huge boxes. Just watch though that shells you want for a collection are not filed or prettied up to attract the eye! Fish restaurants and stalls hold every kind of fish imaginable — served and ready to eat.

NEW YORK: New Zealanders travelling to New York must not fail to see the fabulous American Museum of Natural History. It is located in Theodore Roosevelt Park.

(HINT): Instead of walking solidly for three quarters of an hour in search of the Conchology Section (as I did!) make an appointment to see the Conchologist of the Museum. You will be shown a much wider and rarer collection than is open to the public. But you must also take your time and go through all the different Halls. To see the Natural History Museum thoroughly is as good as touring the United States — it is absolutely unique.

ENGLAND: The warm Gulf Stream sweeps past the coast of Devon, washing into Woolacombe delightful little *Key-hole* and *Slit Limpets* and small *Cowries* somewhat similar to New Zealand's one and only *Ellatrivia memorata,* Finlay. We had a lovely afternoon picking up these shells from the pebbly beach. It was in glorious sunshine, too!

THE CONTINENT—CALAIS: Dunkirk beach north of Calais offers live *bivalve* collecting. South of Calais there is rock collecting but leave time in your schedule. Do not be rushing to catch the boat to Dover!

MEDITERRANEAN: Riparian rights seem to be allocated to all the various hotels along its shores. It is a waste of time searching for shells without a knowledge of the different areas.

COLOGNE: A Scene by the River Rhine. *Lymnea radix* (wandering snail) or a species similar to this is to be found on the banks of the Rhine at Cologne. Fascinated by these snails I was hurriedly gathering them as fast as I could. I had only been on the river sand for five minutes when a voice floated down on the wind: "Hurry, we are leaving for the Cologne Cathedral." In reply I wail, "Oh, give me another five minutes!" Back floats the answer, "No, Sandy and Anne want to move on right away." My architect would have waited for me, but not so friends who were anxious to see the sights!

In conclusion one fact remains obvious. If a conchologist wishes to collect shells when travelling, he or she must travel with another conchologist or make *hard and fast arrangements* for shell collecting *before* leaving New Zealand!

Paryphanta Jamesoni (Powell)

By N. GARDNER

Dr. Powell in the Museum Records Vol. 3, No. 2, notes the occurrence of colour variations in the shell of this snail which is found along the Heaphy Track of West Nelson. Having now collected in this area I can comment a little further on this problem.

The habitat of *P. jamesoni* typical, is the Goulan Hut area. This is a limestone outcrop of no great size, bushclad and on the west-side of Blue Duck Creek, being more or less isolated halfway across the tussock down country. The colour patterns on the shells from this locality are very constant, that is, spirals all over top and dark axial streaks on base.

Further along the Heaphy Track, the next occurrence is at the 5 mile peg, the western edge of the tussock, and on the bank of Saxton Creek. This would also appear to be a limestone outcrop. The few shells collected from the ti-tree appear to be identical to those from the type locality — Blue Duck Creek.

After leaving this locality the track skirts the foot of Slate Range which runs directly southwards. Further collecting along this section of the track to the 12 mile peg, which is over the Collingwood boundary, produced the following records:

Between 6 and 7 mile pegs, shells not uncommon, base still axial streaked though more reddish in colour, the top side of shells not now constant, but showing wide red spirals on 40% of specimens collected.

Between 8 and 9 mile pegs, shells not uncommon, 90% of the bases still axial streaked but with the addition of a darker brown umbilical region. The top of shells in 45% of specimens now has a plain straw coloured area extending from the suture to near the periphery. In the remaining 55% the top is finely spirally lined as in the type locality.

At 12 mile peg, specimens are not common. The specimens taken show a strong red base, no dark umbilical region, and have a more reddish top not strongly spirally lined.

While specimens from the northern limit of this species are fairly constant in colouration, those to the south exhibit a rather bewildering mixture of spirals and axials.

Such a complexity as this exists in the buffer zone of the highland and lowland '*traversi* group' in the North Island. Could it be that a similar zone occurs around the 6 to 7 mile pegs with the prospect of a new species awaiting discovery further south of the boundary, or perhaps around the southern end of the rather low Slate Range in the opposite watershed, some little distance off the Heaphy Track?

Sandy Bay 1961

By L. SEAGER

It was decided, for our second weekend conchology expedition, the venue should be Wooleys Bay, north of Whangarei, so 27 members set off happily having booked five seaside baches.

Wooleys Bay may be unknown to many members, so a few directions will not go amiss. Pass almost through the main north road of Whangarei, until a triangular island is reached, and take the right hand road, signposted "Glenbervie, Ngnugnru". Ngunguru is a large shallow, almost land-locked harbour with a narrow entrance, the channel having numerous sand banks, which can be reached at a low spring tide, a long sandy spit on the southern side, many bays on the southern side, many bays on the northern side, with large rocks, pools, and turnable stones.

On leaving here, pass on until Tutukaka is reached, which has a long sandy, and muddy foreshore but many small bays are varied in their ecology. One towards the block, has large shingly approaches; the next is sandy with fine shingle drifts, and the last is pure sand. Further on is the headland, with reefs.

The last stretch to Matapouri, which is a long sandy bay with a reef on the southern side, where at most times a boat is necessary, although in the warmer weather, wading waist deep will allow one to cross. I have gone over almost dry footed, at the low spring tides. The northern end of the sandy stretch has one small bay, with large seaweed covered rocks at the foot of which many rare shells have been collected, most of these kindly brought in by the hermit crab. Through the hole in the wall, a beach with innumerable rocks which can be turned, will reward the searcher. Across a flat to the left is another sandy and shingly beach. Thence over the hill to lovely Whale Bay and Wooleys Bay with its sandy beaches, many reefs and rocks.

Friday night some of the hardier souls decided to try night collecting, and they made their way to Matapouri. The weather was warm, the sea not too cool, and an almost full moon, made hunting a pleasure. Lanterns were lit, but often reflection from the water made searching difficult. The low tide was at 12.50 a.m. Hopes ran high, and were realised with quite a good haul and a few rarieties. Hermit crabs appeared to be more active than usual and many specimens were obtained in this way. The following are but a few species taken by this method: *Modelia granosa, Phenatoma novaezelandiae, P. zealandica, Aoteadrillia rawitensis, Buccinulum multilineaum aupouria, Baryspira australis, B. mucronata, B. novaezelandiae novaezelandiae.*

The following species were found alive: *Haliotis australis,* and *H. iris* were found on the sides of stones under hanging seaweed, *Penion adusta* crawling in open ground, rock platforms and tidal pools, *Mayena australasia australasia,* fully exposed on foraging expeditions among the rocks, *Buccinulum multilineum aupouria,* exposed on seaweed covered rocks.

Saturday was spent at Whale Bay and members had the pleasure of collecting *Maurea punctulata* which were feeding on the seaweed just after the tide had turned. One lovely slug, *Glossodoris amoena* was found and put in a bucket to be admired by all. Having a camera at the ready, I have a fine picture as members bent down absorbed in the slug. Sunday found us on our way to Ngunguru as most members were leaving for Auckland after the day's shelling, and this was on the way home. Mr. Ayling who had kindly brought his boat along, complete with outboard motor, took two parties over to the sandspit. The rest wended their way towards the northern head. The weather was most unkind, a very cold wind was blowing which made shelling most unpleasant. However, all stuck to their hunting until about four o'clock, when a hot cup of tea was very welcome, and farewells were said. Seven members stayed for a further seven days.

A most unusual find was two *Placostylus hongii,* both washed up on the beach at Matapouri, showing they must live in the vicinity. We were to prove this later at Otara Bay. On the Monday six of us visited the Tutukaka block searching for the elusive *Bulinula lineata,* but only one broken piece was found, so the beach where I have found them in March of each year, let us down, although they do apparently breed just off the northern headland as they have been taken alive from that locality.

However we did find a number of specimens of *Notocochlis migratoria* crab inhabited. I still have to find their habitat in this area, it must be on the muddy bottom somewhere near as they are generally very plentiful as washups and crab inhabited.

No *Nassarius spiratus,* although in March they are generally very much in evidence as wash-ups and crab inhabited. A large number of big specimens of *Murexsul octogonus* were found on seaweed covered rocks which may be reached at low tide. *Buccinulum multilineum auporia* were again in evidence, also *Murexsul mariae.*

Tuesday found us heading north to Otara Bay, having by passed Whananaki, which also should be worth a visit. Over a narrow winding road from Whananaki, we halted at the junction of the clay road, and some members went on Toa Spur where Dr. Powell had told us *Placostylus hongii* would be found. They were there and members collected two a piece for the party and a number of empty shells. Mortality was great amongst the juveniles, no live specimens of the very young were seen, and only a few half grown specimens. Maybe this was the wrong time of the year and they had been buried to escape the dry weather which had prevailed. After lunch Otara Bay was our objective, and the reef as the tide turned gave us a busy time. Further numerous large specimens of *Murexsul octogonus* were collected, *Marginella mustelina,* two *Marginella sp. Haliotis* in plenty, and crab inhabited *Modelia granosa.* Under rocks in the pools large *Cardita brookesi* and *Cookia sulcata.* Another specimen of the little *Baryspira sp.* was found. This shell has been collected from this area by both myself and Mrs. Johnston, Mr. Hipkins now has some, and a few odd specimens have turned up in various collections this weekend.

Wednesday found us again at Matapouri but the weather was most unkind, heavy rain setting in as the tide turned in the late afternoon, but a few specimens were added to the bag including more *B.m. aupouria,* another of the little *Baryspira sp., Agnewia tritoniformis.* The *Buccinulum m. aupouria* showed a very varied colour pattern, and some specimens showed hybridisation making identification exceedingly difficult.

During this weekend and the following four days we only covered a very small portion of this area, which is worthy of much more intensified searching, so perhaps later on we may return and we will have more to tell of Sandy Bay.

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